Národní zemědělské muzeum

MINIBREWERIES AND CRAFT BREWERIES

THOMAS MAIER

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zemědělské
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Tomas Maier

National Agricultural Museum, s. p. o.

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Dedicated to Alena, Josef and Jáchym.

PREFACE

The idea to write such a book was born in my head about ten years ago, but I still couldn't find the time to work on it, and perhaps even worse, I didn't know from which end to approach the chosen issue.

You are therefore receiving a publication that aims to evaluate the segment of microbreweries and craft breweries in the Czech Republic and abroad. Several fundamental problems had to be overcome when preparing the book. The biggest of these was the complete absence of any, even remotely similar, study on this topic in the Czech Republic. In other countries with advanced brewing, there is a lot of literature on this topic, so I hope that this publication will fill that imaginary blank space in the Czech Republic and that other authors will follow up on it. For example, I did not dare to predict the development in this area in the case of the Czech Republic, because the phenomenon of microbreweries is so specific that the answer to the question of what state this sector will be in five or ten years could, in my opinion, only be found in the famous stars.

An equally significant problem for me is the absence of any official brewing technology education (perhaps with the exception of passing tasting tests), so I often had to turn to experts in the given fields for advice. I acquired all my technological knowledge through self-study. Perhaps that is why some shortcomings may appear in the book. Given that about a year passed between the completion of the manuscript of the publication and its publication, some of the knowledge presented in the book may no longer be completely valid at the time of its publication.

So I would be happy if you would contact me with constructive criticism.

INTRODUCTION

The main objective of the monograph is to bring new knowledge and evaluate the history and functioning of the microbrewery and craft brewery sector in the Czech Republic and in selected developed countries of the world. These selected countries are the United States of America, the United Kingdom, Slovakia, Ireland, Belgium, Germany, Japan, Italy, Switzerland, Poland, Denmark and the Netherlands. The selected countries are countries with a solidly developed brewing industry, but above all, they are experiencing a significant development of microbreweries and craft breweries

Microbreweries and craft breweries, not only in the Czech Republic, already form a very distinctive and self- confident market segment of the brewing industry. The development in this area is evident, the number of microbreweries increases significantly every year and the range of beer styles they offer is expanding. The availability of technology is improving significantly, and a number of entities dedicated to consulting and education in this area exist and are emerging. The market is therefore relatively well able to cope with the growing demand for microbreweries and craft breweries for brewers and other employees. In the last few years, consumers have witnessed the emergence of a number of brewing festivals, where the quality of the products consumed is becoming increasingly important, not their quantity, which ultimately leads to an increase in beer culture. Top-level beer festivals are being held more and more frequently, with the possibility of decent tasting of a vast portfolio of beers and beer styles from microbreweries and craft breweries. The market is on the path of diversification, and although this is only the author's expert estimate, at least over the last 150 years in the lands of the Czech Crown, the offer of beers has not been as diverse as it was in 2019. However, it is more likely that the diversity of beer styles has never been at such a level in our territory. The situation with availability was much worse, which, due to the short shelf life of beer, not-so-perfect storage and stabilization technologies, and limited transport options, could not be at the same level as today. The significant unification not only of brewing began with *the industrial* revolution and the advent of a number of improvements and inventions from many scientific fields. Beer production is one of the most complicated and demanding productions of alcoholic beverages in general. It is much more complex than the production of wine or other (fermented) alcoholic beverages. Compared to other branches of alcoholic beverage production, much greater emphasis must be placed in brewing, especially on hygiene and sanitation.

In general, it can be stated that the flourishing of microbreweries or craft breweries occurred where the market had already reached such a degree of concentration and unification of the product that some consumers could not accept this state of affairs. The United Kingdom and the United States are competing for a kind of imaginary primacy in the emergence of the phenomenon of microbreweries and craft breweries . However, the conditions were completely different in each country. In the United States of America, the unification of the product was 100%, and so new interesting beer types and styles burst onto the market all the faster , stirring up the extremely stagnant waters of the brewing industry there in an unrepeatable way. In contrast, in the United Kingdom, absolute unification of the product was far from achieved, and the emergence of a new wave of microbreweries and craft breweries was therefore slower, which is probably also related to the traditio conservatism of the local market. In the Czechoslovak Socialist Republic in the 1970s and 1980s, normalization was underway and private entities could not exist on the market. However, Czech brewing remained unique with its *lager* . The Czech Republic's time in the field of microbreweries and craft breweries came several decades later, after 2009.

In 2019, the segment of Czech craft breweries and microbreweries was already at the forefront of global development. Czech suppliers of brewing technology are expanding globally and building brewing facilities in both developed and developing countries. Czech brewers, who are highly valued abroad and more than well-paid, are doing a great job of advertising the entire sector.

Despite the aforementioned boom in microbreweries and craft breweries, there has not yet been a professional book in our country that would properly evaluate the entire segment from a sociological, economic and historical perspective. The presented monograph thus aims to fill this imaginary blank space and, moreover, to provide a comparison with other parts of the world where a similar boom in microbreweries is also taking place.

Until now, in Czech conditions, only more or less successful guidebooks have been and are being written on the topic of microbreweries or craft breweries. The author of this monograph certainly does not want to reduce their quality in any way, unfortunately in the age of the Internet, printed guidebooks are already outdated at the moment of their publication. However, one publication, which is also cited in this monograph, must be highlighted above the others, namely *Restauraÿní minipivovary v ÿeské republice* [1]. The publication was published in 1999, i.e. before the greater advent of the Internet. The eighty-page book is also designed more as a guidebook, but in the introduction it offers several very interesting observations about microbreweries in general. In addition, it is valuable from a historical point of view, since many of the presented microbreweries have long since closed and it is very difficult to obtain the necessary information about them.

On the other hand, abroad, especially the Anglo-American one, is saturated with professional literature on the subject under consideration. This fact was of great help to the author of this publication in analyzing and evaluating foreign (mini)brewery markets.

Probably the most successful holistic foreign publication of recent times is the collective monograph titled *Economic Perspectives on Craft Beer: A Revolution in the Global Beer Industry* from 2018[2]. It is edited by Garavaglia, who works at the University of Milan, and Swinnen, who is a full professor at the Catholic University of Leuven. The main part of the book analyzes and evaluates the segments of microbreweries and craft breweries in the United States of America, Canada, Latin America, and Colombia, Belgium, Denmark, Germany, Hungary, Italy, the Netherlands , Poland, Slovakia, Spain, the United Kingdom, Australia, Japan , and China. There is no other similar publication that would evaluate so much in such detail

1 ÿAPKOVÁ, Veronika – JANÍK, Petr – POTÿŠIL, Václav, *Restaurant microbreweries in the Czech Republic ce,* Prague 1999.

2 GARAVAGLIA, Christian - SWINNEN, Johan (edd.), *Economic Perspectives on Craft Beer,* London 2018.

important states. As can be seen, the Czech Republic is missing from the countries mentioned, which is undoubtedly not its right, since it occupies a prominent position in this area in many respects. The above-mentioned monograph was created primarily thanks to the international academic organization called the Society of Beer Economists[3], which was established in 2009 under the leadership of the aforementioned Johan Swinnen. The society subsequently began organizing Beeronomics conferences (biennials), which have so far been held in Leuven (2009), Freising (2011), York (2013), Seattle (2015), Copenhagen (2017) and in Pilsen in 2019. The Czech Republic thus became the first post-communist country in which this event was organized. A significant benefit of the conferences is meeting other experts and the resulting establishment of new possibilities for coopera

Other equally important monographs are *The Economics of Beer nomics:* [4] *and Beero-How Beer Explains the World*[5]. The first publication provides a very concise historical and economic analysis of the world's major brewing markets. The second publication examines how beer (or fermented grain beverages) has influenced history and, conversely, how history, social development, and subsequently scientific -technical developments influenced beer as a beverage.

An important source of information is the internet, which usually provides the most up-to-date data possible. The most useful sources include the Customs Administration of the Czech Republic, pivovary.info and pivni.info.

There are a number of popular science publications, without which this book could not have been written in sufficient quality. Let us mention at least the numerous publications of Michael Jackson (1942–2007), who in a way was at the birth of the segment of microbreweries and craft breweries in England. In the 1970s, when the prestige of beer was significantly lower than today, he began writing about beer in newspapers and subsequently publishing books.

The presented monograph can be divided into two parts. The first is more focused on Czech conditions, but the connection with foreign countries is taken into account, because no microbrewery market is completely closed or autonomous. The introductory passages deal with the actual definition of the terms “microbrewery” or “craft brewery”. The second part of the book is devoted to twelve selected countries in the world, in which the segment of microbreweries and craft breweries (similarly to the Czech Republic) has also occupied a significant position and is developing rapidly . In addition to selected developed Western countries, two post-communist countries are also evaluated here – Poland and Slovakia.

The research questions addressed in this monograph are summarized in the following areas . First of all, it is necessary to answer the question of what a microbrewery or craft brewery actually is and how it differs from a regular (conventional or industrial) brewery. At first glance, it is obvious that the difference does not lie only in size or the height of the exhibition. The modern brewing industry continues a thousand-year-old tradition

3 English: Beeronomics Society, this company was founded in 2009 in Leuven, Belgium.
4 SWINNEN, Johan FM (edd.), *The Economics of Beer,* Oxford 2011.
5 SWINNEN, Johan - BRISKI, Devin (edd.), *Beeronomics: How Beer Explains the World,* Oxford 2017.

production of fermented beverages from grain, and so it is also necessary to analyze the historical aspects of the origin and development of "old beer" (a fermented beverage from grain).

After clarifying what can actually be considered as microbreweries and craft breweries, it is possible to proceed to solving another research question, i.e. the quantification of these entities both in the Czech Republic and in selected parts of the world. For the Czech Republic, a separate quantification of microbreweries and craft breweries is then carried out in terms of the type of fermentation used, from a regional perspective (according to regions) and finally from a perspective of continuity with the now extinct tradition of brewing in a specific entity. Microbreweries and craft breweries are often indispensable entities of regional, social and political -legal development, which is why the question is also raised here of how these aspects are reflected in the quantification of these entities themselves. Another problematic area is the economic functioning of microbreweries and craft breweries; this aspect is also addressed in the presented book. In conclusion, a quantitative comparison of the segments of microbreweries and craft breweries between selected countries of the world is carried ou

In Czech conditions, the presented monograph is absolutely unique - from a professional point of view, the Czech market of microbreweries and craft breweries has never been evaluated in such detail. The work is primarily intended for the professional public, for whom it fills an imaginary blank space in the absence of literature. The publication should also serve many organizations or institutions, especially state administration bodies for the design of economic policies, whether those related to the fiscal area (beer is subject to excise duty), employment or regional development.

Microbreweries usually have so-called associated production, which often has a very positive impact on regional development. The book will undoubtedly be useful in subsequent research in this area. It is highly likely that the entire segment will continue to develop rapidly and that other entities or individuals will address the issue. Another target group targeted by this monograph are private entities, or rather professional organizations that represent these entities and defend their interests. For the Czech Republic, we can name the Czech-Moravian Association of Microbreweries, the Czech Association of Breweries and Malteries, as well as other entities in the entire beer production vertical. In connection with the above, the book is also intended for homebrewers and entities intending to enter the industry, so that they can better plan their economy and strategy. The penultimate link in the product vertical are gastronomic establishments (not connected to breweries), which are increasingly including the products of microbreweries and craft breweries in their assortment (especially beer bars with so-called multi-taps). These entities can also find a number of suitable ideas in the book. At the top of the imaginary pyramid stands the consumer himself, who is increasingly educated in the field of microbreweries and demands more and more information - the book is also intended for him.[6]

6 The scientific monograph was created as an output of the Science and Research Concept of the National Agricultural Museum, sp o., 2016–2022, with the support of the Ministry of Agriculture of the Czech Republic for the long-term conceptual development of the research organization (MZE-RO0818).

1 METHODS USED

A frequently used method was the study of documents, especially professional books, studies and articles. The texts mentioned came from a number of social science fields – sociology, history, economics, etc. The field of economics then includes the collection and study of various types of statistics. The most widely used statistical data were from the Customs Administration of the Czech Republic, the Czech Association of Breweries and Malteries and Brewers of Europe, which is a transnational brewing organization that in 2019 brought together 29 European national brewing associations.

Another widely used method was interviews with experts, both domestic and foreign. Basic statistical methods were used in quantitative analyses . Basic financial analysis methods were applied in the economic analysis of the establishment and operation of a model microbrewery, and the straight-line depreciation method was chosen for the depreciation of the model microbrewery equipment. Brewery equipment falls into the second depreciation class, in which the depreciation period is five years. After five years, the expenses for the acquisition of the equipment are fully reflected in the costs.

When comparing individual markets, or regions, the comparison method was used . Here, one of the already mentioned rather unpleasant pitfalls appeared. In general , there is no universal definition of a microbrewery, which made regional comparisons considerably more complicated.

For the development of microbreweries and craft breweries, the degree of concentration of the traditional brewing market is often a key aspect. A number of indicators can be used to determine this . The concentration coefficient was most often used here. It is a simple sum of the market shares (most often of the five) largest companies in the industry expressed in percentages.

Sometimes there is a problem with defining different beer styles. The opinions of experts often differ, which is often exacerbated by the shift in the perception of beer style in individual time periods, so the publication adheres to the broadest possible definitions, which are favored by most authors.

2 DEFINITION OF A MINIBREWERY

A fundamental and very difficult problem to solve is the definition of the word “minibrewery”. Everyone imagines something completely different under this term. There is no exact translation of this word from English, as the literal translation “minibrewery” is not used in English. The most similar is the English word “microbrewery”, however, the prefix “micro-” means something even smaller than “mini-”. A possible explanation is that in the United Kingdom the first “tiny breweries” were a kind of more sophisticated version of home beer production, so we could call them “microbreweries”. The American Brewers Association then states a maximum annual production limit for “microbreweries” of 15,000 barrels,7 i.e. 23,848 hl.

Microbreweries generally also focus on less traditional beers, which they brew either permanently, seasonally, or only occasionally. The legal systems (valid legislation) of individual countries also do not know the terms “microbrewery”, “craft brewery”, etc. Official definitions are used rather by professional organizations, in the Czech lands this is the Czech-Moravian Minibrewery Association, z. s. The statutes8 of this organization state: “Among the active members of the Association are microbreweries with an annual beer production capacity9 of up to 10,000 hl of beer, which are small independent breweries according to the provisions of Section 82 of Act No. 353/2003 Coll., on excise duties.” The wording clearly shows that only a microbrewery with an annual production of up to 10,000 hl of beer can become a member of the association. hl, however, this does not exclude the possibility that a production unit producing beer above this limit could not be called a microbrewery, of course without the possibility of joining the association. Another essential aspect is the condition that a microbrewery must also be a small independent brewery, in simple terms, it must not be connected in any way (property, legal, licensed production, joint production equipment) with another (large) brewery. For example, a microbrewery cannot be considered a microbrewery that is part of the Litovel industrial brewery,10 or an experimental microbrewery located directly in Plzeÿský Prazdroj.

In simple terms, it can be stated that the Czech-Moravian Association of Microbreweries has as its only criterion for defining this term the quantitative aspect of annual production , because only this aspect can be expressed unambiguously and exactly.

In addition to the quantitative aspect of the definition of the term "microbrewery", the temporal aspect is also important. The great beer expert Garett Olivier states that the term "microbrewery"

7 Brewers Association, Craft Beer Industry Market Segments, available online: <https:// www.brewersassociation.org/statistics-and-data/craft-beer-industry-market- -segments/> [31. 7. 2019].

8 Czech-Moravian Association of Minibreweries, Statutes of the Czech-Moravian Association of Minibreweries, available online: <http://www.minipivo.cz/cz/stanovy/ÿ [7. 5. 2018].

9 The technical term "exhibition" is only used in the brewing industry; in other industries, the word "production" is commonly used. It is used because the barrels with the produced beer were placed in the brewery courtyard, hence the term "exhibition".

10 The Litovel brewery, together with the brewery in Hanušovice and the Zubr brewery in Pÿerov, is part of the company PMS Prerov, as

Experimental brewery of the VÚPS, Brno branch, on the right the then head of the inspection department Miroslav Olbrecht

Photo: *Brewing and Malting Research Institute, Brno branch, provided by Karel Kosaÿ, photo taken in 1951/1952*

(originally "microbrewery") is a contemporary term, but the same no longer applies to the concept. In the 1970s, small breweries began to appear in the United Kingdom; the term "microbreweries" was used by small entrepreneurs who produced strong-tasting beers in smaller buildings or sheds. At that time, there was no small brewing equipment available, so microbrewers built their brewing systems from old dairy equipment and bought discarded small tanks from large breweries.11 This shift went hand in hand with the founding of the "Campaign for Real Ale" (CAMRA) . This happened in 1971. The reasons for the founding of this organization are analyzed later in the text in the chapter dedicated to the United Kingdom. According to Olivier, the microbrewery movement flourished in the 1990s in the United States and spread to all corners of the world as craft brewing in the first decade of the 21st century.12 Olivier thus places the origins of the microbrewery segment in the United Kingdom, rather than the United States. This issue is discussed more in the chapters dedicated to individual countries or regions.

11 OLIVER, Garrett, *The Oxford Companion to Beer,* Oxford 2011, p. 585.
12 Ibid., pp. 270–271.

Samuel Adams beer, produced by Boston Beer Company
Source: *Boston Beer Company, available online: <https:// www.samueladams.com/ Presentation/ SamAdamsredux/ includes/ images/ img_shield199. png>* [14. 4. 2019]

Quite often, the terms “microbrewery” and “craft brewery” are used for one and the same entity , while the term “craft brewery” is used much more widely in the world. To a large extent, craft breweries can sometimes be understood as a kind of successor to microbreweries (when the microbrewery has grown somewhat), or rather microbreweries are one of the types of craft breweries. In the United States of America, however, the craft brewery segment lives a very self-confident life, the second largest “craft brewery” in the USA, Boston Beer Company, had a production of 4.7 million hl in 2016, which is about 23% of the entire Czech production. It is therefore obvious that the terms commonly used in the USA cannot be applied in the Czech Republic or elsewhere. The reasons lie both in the size of the market and in history. It is stated above that the origin of the term "microbrewery" is linked to the 1970s, so then the "microbrewery" U Flekÿ, allegedly founded in 1499, could not be considered one. Many people do not consider it a microbrewery and call it either a small industrial brewery or an old brewery.

The very definition of the term “minibrewery” has also changed over the years in Czech conditions. The first Czech minibreweries, established in the 1990s, brewed only generally widespread types of beer. Firstly, because there was no knowledge in the country about the production of other types of beer than *lager,* and secondly, because there was no consumer demand for these types of beer. At that time, the minibrewery segment did not form a completely autonomous area of the brewing industry. Minibreweries were much more competitive with large industrial breweries, and many of them did not survive the fierce competition on the market. The entire Czech beer market was significantly more homogeneous in terms of products, which was largely a legacy of the centrally planned economy. During the communist-controlled economy, only bottom-fermented beers were produced in the country, and the most prominent “specialty” was dark bottom-fermented beer.

Logo of the Brewers Association of the United States
Source: *Brewers Association, available online: <https:// www.brewersassociation. org/ wp-content/ uploads/ 2015/01/ brewersassociation.png>* [14. 4. 2019].

But let's go back to microbreweries and craft breweries in the United States. The American Brewers Association defines a craft brewery as:

Small

Annual production is 6 million barrels (9,539,240 hl) or less. Beer production is characteristic of a brewer with respect to the rules of alternating exclusive ownership.

Independent

Less than 25% of the craft brewery is owned or controlled (or has an equivalent economic interest13) by an entity in the alcoholic beverage industry that is not itself a craft brewery.

Traditional

A brewery where the majority of the alcohol value in the beer comes from traditional or innovative ingredients and their fermentation. Flavored malt beverages are not considered beer.14

The definition is therefore definitely not applicable to Czech craft breweries, as, for example, the annual production of the largest Czech brewing company, Plzeÿský Prazdroj, was approximately 8.5 million hl in 2017. For Czech conditions, the above definition is extremely maximalist.

Apparently the first to attempt to define a microbrewery in our country was ÿapková and colleagues (1999) in their thin publication *Restaurant Microbreweries in the Czech Republic.*

13 It could be, for example, a distribution company or a network of microbreweries.
14 Brewers Association, Definition of Craft Brewery, available online: <https://www.brewersassociation.org/brewers-association/craft-brewer-definition/> [6. 5. 2018]

The authors consider *a* microbrewery to be an enterprise with an annual output of most often 500–3000 hl, however, they extend the definition of a microbrewery to a maximum production capacity of 10000 hl of beer per year, which corresponds to the group with the lowest excise tax.15 They further state that a microbrewery can be built independently and sell its beer, or – which is the more common case – it is connected to a restaurant, in which case it is a restaurant microbrewery.16 The definition is quite precise due to its generality, and it also introduces the term "restaurant microbrewery". Verhoef offers a historical perspective on the above, according to which these establishments date back to the times when innkeepers themselves brewed beer for their customers.17 This refers to the medieval and early modern period of legal breweries, when each such establishment usually had its own pub.

The author of the presented monograph attempted to provide a more specific definition of a microbrewery, or rather a typical microbrewery , in 2013. According to it, a microbrewery must meet the following conditions:

1. production is not higher than 1000 hl/year;
2. does not have its own distribution network;
3. does not export its production;
4. the production cannot be purchased in any regular store;
5. most of the production is usually consumed in the restaurant itself;
6. is not owned by any large company, the owner is usually one person or small legal entity;
7. The owners do not only pursue their economic interests unconditionally, but are also enthusiasts in their own way;
8. business interests are not dependent only on economic interests;
9. Beer is only rarely bottled in glass bottles, it is often used bottling into PET bottles.18

This is already a somewhat outdated definition, which is in a way due to the time in which it was published. Certainly, the vast majority of microbreweries still fit into these conditions, but for example, the Hostivar brewery, which had 86 shareholders in 2018, is already in direct contradiction with point no. 6. There would be a whole host of similar discrepancies. This definition can therefore be considered too specific. Moreover, the stated conditions apply more to a restaurant microbrewery, which essentially does not sell its beer anywhere else, or sells it in limited quantities.

This monograph will therefore adhere to a clear definition, whereby a microbrewery is understood as a brewery whose annual production does not exceed 10,000 hl of beer, regardless of its ownership or other connections with other breweries or microbreweries.

15 ÿAPKOVÁ, V. – JANÍK, P. – POTÿŠIL, V., *Restaurant microbreweries,* cd, p. 3.
16 Ibid., p. 3.
17 VERHOEF, Berry, *Great Encyclopedia of Beer,* Dobÿejovice 2003, p. 11.
18 MAIER, Tomáš, *Selected Aspect of the Microbreweries Boom,* Agris On-line Papers in Economics and Informatics, 2013, 5, 4, p. 136–137.

A special type of microbrewery can be those that produce beers from wort concentrates, i.e. they completely skip the brewing process. Examples include the Prague brewery Ladronka (founded in 2018) or Charlie's Square in Brno (founded in 2014). However, these breweries usually do not explicitly advertise their technology for marketing reasons.

A restaurant microbrewery19 is a microbrewery whose beer is mostly consumed in a restaurant connected to the microbrewery. The largest restaurant microbrewery in the Czech Republic is the U Flekÿ microbrewery, whose annual production in 2016 reached 2,750 hl. Usually, the microbrewery and restaurant are owned by the same entity, but the opposite cannot be ruled out, such as the ÿeporyje microbrewery, where the production and restaurant parts are owned by different entities.

Any of the above-mentioned breweries and other slightly larger breweries that exceed an annual production of 10,000 hl can be considered a craft brewery . These are usually successful microbreweries that have already surpassed this threshold.

Quantifying Czech microbreweries has several pitfalls. The first of these is the question of whether or not to include laboratory, educational, university or experimental breweries in this number. As of December 2017, experimental microbreweries were operating in the following institutions:

ÿ *Czech University of Agriculture in Prague*

ÿ *University of Chemical Technology in Prague*

ÿ *Brewing and Malting Research Institute, Prague*

ÿ *Brewing and Malting Research Institute, Brno*

ÿ *Secondary Technical School of Food Technology, Prague*

ÿ *Dr. Václav Šmejkal Secondary Vocational School, Ústí nad Labem*

ÿ *Hop Institute, Žatec*

ÿ *Mendel University in Brno*

ÿ *University of South Bohemia in ÿeské Budÿjovice*

ÿ *Secondary vocational school for ecology and food, Veselí nad Lužnicí*

ÿ *PMS Litovel*

ÿ *Pilsner Brewery, Pilsen*

The last two breweries do not meet the definition of a small independent brewery because they are part of a large industrial brewery. However, all of the above entities were included in the total number of microbreweries.

For the sake of completeness, it is appropriate to provide a definition of the so-called flying brewery20, which should correctly be a contract brewery, sometimes referred to as a nomadic brewery. It is a brewery that

19 The closest English term is “brewpub”.
20 English "contract brewery", "gypsy brewery" or "phantom brewery".

Suchdolský Jeník – brewery
Photo: *Author's archive*

which has its own recipe and its own beer name, which it either has produced elsewhere or produces itself, because it does not have its own production equipment. It is therefore a certain form of licensed production. These flying breweries are often a preliminary step to acquiring its own technology and the so-called landing of a brewery . The variability of flying microbreweries is considerable, the most common is real involvement , when the flying microbrewery itself carries out production on rented equipment . In an extreme case, however, flying breweries simply label some commonly produced beer and sell it under its own name. In any case, the flying brewery must be perceived more as a commercial item, because ultimately it buys beer from the production brewery and then resells it. The flying brewery also never has a customs warehouse, and therefore does not pay excise duty, which is paid by the production brewery.

Some microbreweries brew beer from wort or wort concentrate , but this method of preparation is usually not well received by consumers. The reasons why some brewery operators do this are as follows:

1. Economy – the initial costs of purchasing such a microbrewery are based on much cheaper. Instead of a full-fledged two-vessel brewhouse, a microbrewery only needs to have a container for dissolving/mixing the respective concentrate in water, which also saves energy costs for brewing.
2. Time – boiling wort usually takes more than two hours, and hop boiling usually takes another 90 minutes, so using wort or wort concentrate saves a lot of time.

3. Education and training of the operator (brewer) – preparing beer from wort or wort concentrate is much easier, so there is no need to have such a well-trained operator.

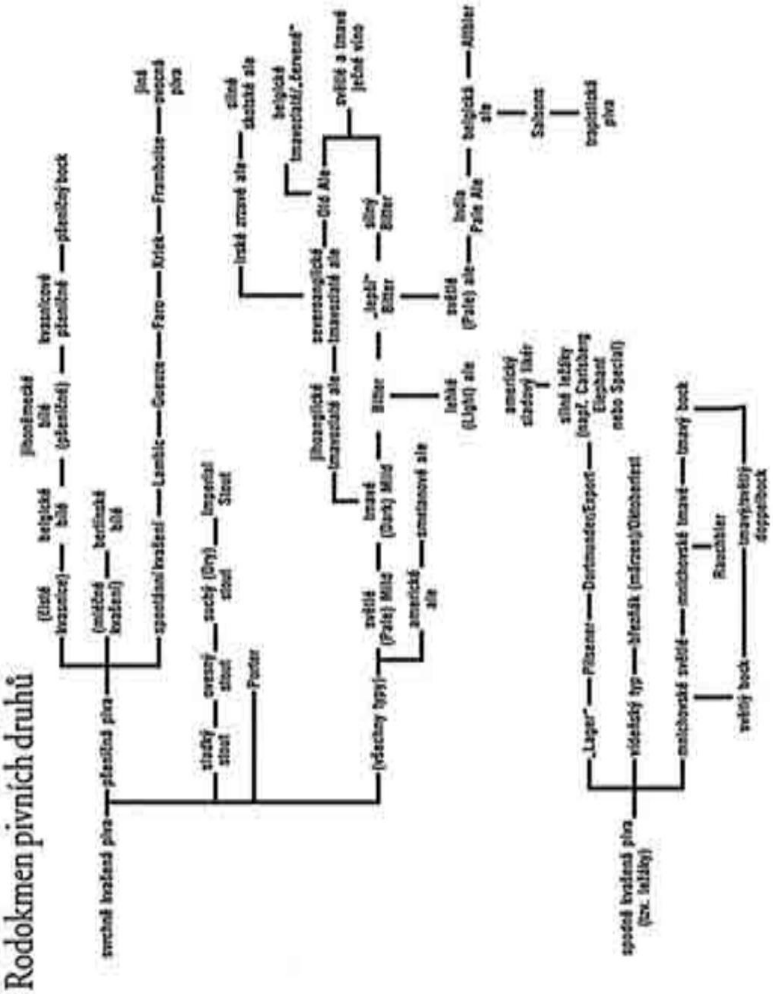
4. Space – these breweries do not need to have two brewing vessels, which saves space that can be used for storing malt.
5. Logistics – there is no need to further consider what will happen to the waste threshing, and the volume of input raw materials (wort or wort concentrate) is also significantly smaller.

2.1 BEER PEDIGREE OR BEER STYLES

Similar to the terms "microbrewery" or "craft brewery", it is quite difficult to define the term "beer" precisely and simply. Linguistically, this expression comes from Old Slavonic and meant “everything that is drunk”.21 In Czech conditions, the most relevant legal definition is probably in the Decree on Requirements for Beverages , Fermented Vinegar and Yeast, which states: “For the purposes of this Decree, a) beer is understood to be a foamy beverage produced by fermenting wort prepared from malt, water, unprocessed hops, processed hops or hop products, which, in addition to ethanol and carbon dioxide formed by the fermentation process, also contains a certain amount of unfermented extract; malt can be replaced up to one third of the weight of the total extract of the original wort with an extract of, in particular, sugar, cereal starch, unmalted cereals or rice; in the case of flavoured beers, the alcohol content can be increased by the addition of spirits or other alcoholic beverages…” The basic division of beer styles is into bottom-fermented beers (formerly known [22]

as bottom-fermented beers) and top-fermented beers (formerly called top-fermented). The group of top-fermented beers is much richer in style, including all beers such as *ales, porters, stouts,* wheat beers, etc. In general, it can be said that top-fermented beers are sensory richer than bottom-fermented beers and their taste and aroma often have notes of fruit. Some authors also distinguish beers from top-fermented beers

21 Consultation with the creator of Modern Slovene, Vojtÿch Merunka.
22 Decree No. 248/2018 Coll., on requirements for beverages, fermented vinegar and yeast, Collection of Laws, 31. 10. 2018.



Family tree of beer species
Source: *Žejdlík.cz, Family tree of beer types, available online: <http:// cdn2.beta.pivoatlas-cz.vps.wpsh.cz/ system/ images/ W1siZiIsIjIwMTUvMDQvMDQvMzhhdHN1Nm1wZF9yb2Rva21lbnBpdjExLnBuZyJdXQ/ family treepiv11.png*> [14. 4. 2019].

spontaneously fermented, which are described in more detail in the chapter dedicated to Belgium. The group of bottom-fermented beers is not as diverse, as the technology of bottom fermentation is significantly younger, but it can be assumed that the diversity of this group of beers will continue to develop. Bottom-fermented beers began to spread massively only from the mid-19th century with the advent of the industrial revolution.

3 HISTORY OF BEER AND BREWERY

Beer is considered the second oldest alcoholic beverage of mankind, after fermented drink made from dates (or other fruits), but it is possible that beer is even older. However, there is not enough evidence to determine this definitively. The date palm, even in its wild form, contains up to 14% sugar,23 which is a sufficient concentration for effective alcoholic fermentation. Wine is a much younger alcoholic beverage , because first it was necessary to breed, or rather select, grape varieties with sufficient sugar content.

Beer as we know it today, let's say the most widespread *lager,* has nothing in common with the first fermented grain beverages in terms of its sensory profile. Today, the first stage of beer production is the boiling of mash; "primitive beer" was not boiled at all, only unmalted grain was mixed with water. Grain itself had to be available to produce the first fermented beverages . According to some sources, people were already using grain sometime around 20,000 BC,24 but at that time they were not yet active farmers, they were gatherers who lived a nomadic lifestyle. Wheat has been found in the city of Haifa from 16,000 BC. The emergence of agriculture, i.e. the beginning of the agricultural revolution, is dated to between 12,000 and 9,000 BC. l.25 Prehistoric finds from the Jordan River Valley show that date palms were planted as early as 11,300 years ago and cereals were grown in Syria as early as 7,000 years ago.26 The literature states that cereals were grown in Mesopotamia as early as the 10th millennium BC.27 Rice and millet were probably domesticated in China at the same time. The first fermented cereal drink can therefore probably be dated to this time, but calling this drink beer is quite problematic. The first fermented cereal drink probably originated when water rained down or otherwise got into a container with cereal, which, in the presence of various microorganisms, triggered the process of spontaneous fermentation, and one of the early farmers of the time tasted the creation and discov

In 2018, a scientific article was published about a ritual feast in the Raqefet cave in Israel from the Natufian culture, which was dated to 13,000 years ago. Remains of grain mash were found in stone vessels in the cave, and the authors of the article prove that members of this culture were still gatherers and hunters, so fermented grain drinks could even be older than the domestication of cereals itself.28

23 Plants FOR A FUTURE, Phoenix sylvestris – (L.)Roxb., available online: <https://pfaf.org/user/Plant.aspx?LatinName=Phoenix+sylvestrisÿ [7. 5. 2018].

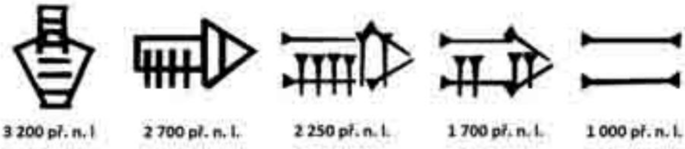
24 ARYA, RL - ARYA, Sonan - ARYA, Renu - KUMAR, Janardhan, *Fundamentals of Agriculture,* Jodhupur 2015, p. 3.

25 GRININ, Leonid, E., Production Revolutions and Periodization of History: *A Comparative and Theoretical-mathematical Approach,* Social Evolution & History, 2007, 6, 2, p. 87.

26 National Geographic, The Development of Agriculture, available online: <https://genographic.nationalgeographic.com/development-of-agriculture/ÿ [7. 5. 2018].

27 BASAÿOVÁ, Gabriela – HLAVÁÿEK, Ivo – BASAÿ, Petr – HLAVÁÿEK, Jan, *Czech Beer,* Prague 2011, p. 18.

28 LIU, Li – WANG, Jiajing – ROSENBERG, Danny – ZHAO, Hao – LENGYEL, György – NADEL, Dani, *Fermented beverage and food storage in 13,000y-old stone mortars at Raqefet Cave, Israel:*



The development of the character for beer in Sumerian cuneiform
Source: *Leopold Costa's blog, The evolution of written symbol for beer in cuneiform, available online: <http:// 1.bp.blogspot.com/-bj4Y-Lg2C2s/ TzWnY03bnil/ AAAAAAAAGWE/ a0hSHWPzoHo/ s1600/ Beer+The+evolution+of+the+written+symbol+for+beer+in+cuneiform.jpg>* [14. 4. 2019].

Wild barley (Hordeum spontaneum)
Photo: *Private archive of Antonín Dreiseitl*

Mashing vessels, where "primitive beer" fermented 13,000 years ago
Photo: *Dani Nadel's private archive*

Another technological improvement was probably the invention of malting, although this discovery could also have been a coincidence. The grains in the container could have germinated slightly due to moisture, and “malt” was born. However, the product lacked one technological phase in its preparation – the boiling process, which was undoubtedly carried out (invented) intentionally. The above-mentioned technological improvements increased the quality of the resulting product and led to a greater yield of grain (malt). The first known recipe for making such a beverage, produced by the boiling process from malted grain, is contained in the Hymn to Ninkasi from 1,800 BC (Ninkasi was the Sumerian goddess of be

Investigating Nature and ritual feasting, Journal of Archaeological Science: Reports, 2018, 21, p. 792.

Wild hops in their native Caucasus
Photo: *Private archive of Vladimír Nesvadba*

The Sumerians and later the ancient Egyptians consumed fermented beverages from large vessels using straws. The "beer" had a more mushy consistency, and they often used ground breadcrumbs instead of malt.

A cloud of mystery hangs over the use of hops, i.e. hopping in beer. Hops have their origins in the fertile lowlands below the Caucasus. As early as the time of the Sumerians and ancient Egyptians, it is commonly documented that beer was flavoured with various herbs, fruits or other ingredients. For example, bitterness was often achieved by using toasted bread during fermentation. However, hops are not only a flavouring or spice for beer, but also a natural preservative, as they have bactericidal effects. Some researchers believe that hops were used primarily by the Slavs to flavour and preserve beer , at least 1,000 to 1,500 years BC. They are credited with spreading the cultivation of hops and introducing the spontaneous use of hops to bitter beer.29 However, this claim can be disputed, because no other author mentions anything like this, and moreover, it is more than a thousand years before the Slavs emerge in history as an ethnic group of Indo-Europeans. Historians tend to believe that the first person to describe hops more or less botanically was the Roman philosopher and naturalist Pliny the Elder (23–79 AD). He considered it a vegetable; at that time, young hop shoots (hops or axils) were consumed like asparagus. Jackson states that Jewish records speak *of sicera* (strong drink) *ex lupulis confectam*
from the time of the Babylonian [30]
captivity (made from hops).31

29 BASAÿOVÁ, Gabriela – ŠAVEL, Jan – BASAÿ Petr – LEJSEK Tomáš, *Brewing: Theory and Practice beer production,* Prague 2010, p. 37.
30 Early 6th century BC to 537 BC
31 JACKSON, Michael, *Encyclopedia of Beer,* Prague 1994, p. 18.

Founding charter of the Vyšehrad Chapter
Source: *National Archives of the Collegiate Chapter of Vyšehrad (1130–1523) 2, available online:* <*http:// monasterium.net/ mom/ CZ-NA/ KVs/ 2/ charter*> [11. 11. 2018].

Other authors add that the oldest known use of hops in beer production dates back to 600 BC.32 The first (modern) written record of hops dates back to 768, when the Frankish king Pepin the Short donated a hop garden to the monastery of St. Dennis.33 The use of hops in beer production was documented as early as 822 in the Benedictine abbey of Corbie in Picardy (northern France), recorded by the local abbot Adalhard. Some sources state that the first mention of hop cultivation in our country dates back to 859.34 However, this data cannot be considered reliable , both due to the absence of written monuments from this period and because the date is not supported by any specific historical source. Probably the oldest document about hop cultivation in the present-day territory of our state is the foundation charter of Prince Bÿetislav I (1034–1055), by which the chapter of St. Wenceslas in Stará Boleslav was granted a tithe of hops from the courts in Žatec, Stará and Mladá Boleslav.35 The first Czech

32 SMITH, Gregg – Getty, Carrie, *The Beer Drinker's Bible,* Prague 2003, p. 47.
33 RABIN, Dan - FORGET, Carl, *The Dictionary of Beer and Brewing,* London 1998, p. 144.
34 Syngenta Czech Republic, Hops, available online: <https://www.syngenta.cz/chmel> [9. 4. 2019].
35 BASAÿOVÁ, Gabriela – HLAVÁÿEK, Ivo, *Czech Beer,* Pacov 1999, p. 15.

Antonie van Leeuwenhoek

Source: *Antonie van Leeuwenhoek, available online: <http:// www.essentialvermeer.com/ dutch-painters/ dutch_art/ dutch-art-images/ leeuwenhoek_e.jpg*> [14. 4. 2019].

Theodor Schwann

Source: *Theodor Schwann, available online: <https:// media.credoreference.com/ wileyenlisci2007/ fig_a0002475_fgz001.jpg*> [14. 4. 2019].

The king, although not yet hereditary, was Vratislav II. and we owe it to him for the first direct record of beer in our territory. This king issued a foundation charter in 1088, which directly mentions a tithe of hops for brewing beer. The charter even mentions the names of three Czech brewers – Sobík, Šešÿr and ÿastoÿ.36 He also mentions a brewery in Trávník, which was supposed to be located below Vyšehrad,37 probably the oldest documented brewery in the lands of the Bohemian Crown. However, the oldest is generally considered to be the brewery in Cerhenice, which was supposed to be founded in 1118.38

The path of hops to definitively establishing themselves as the main herb (spice) for beer production was very slow. On the European continent, it did not occur until sometime in the 14th or 15th century. In the British Isles, the process took much longer, and it was only in the 19th century that hops became completely dominant. Originally, unhopped beers produced here were called *ales.*

From a historical perspective, the least documented ingredient for beer production is probably yeast. Sometimes these two synonyms are confused with the term yeast, which is a kind of secondary product. Brewer's yeast, or yeast, are microorganisms that produce alcohol under suitable conditions. The first person to observe yeast under a microscope was probably the Dutch scientist Antonie van Leeuwenhoek (1632–1723). However, he himself did not consider them to be living microorganisms, he believed that they were parts of grains. The German scientist Theodor

36 PÍŠA, Rudolf, *Breweries and malting plants: a catalogue of securities,* Prague 2008, p. 9.
37 BASAÿOVÁ, G. – ŠAVEL, Jan – BASAÿ, P. – LEJSEK, T., *Brewing,* cds 22.
38 Ministry of Agriculture, Czech Beer – A Jewel of the Czech Republic, available online: <http://eagri.cz/public/web/file/353955/ceske_pivo_CZ_web.pdf> [10. 1. 2019].

Louis Pasteur

Source: *Louis Pasteur, available online: <https:// www.sapaviva.com/ wp-content/ uploads/ 2017/06/11.-Louis-Pasteur-1822-1895-1-336x336.jpg>* [14. 4. 2019].

Emil Christian Hansen

Source: *<https:// thedailygardener.org/ emil-christian-hansen/ >* [14. 4. 2019].

Schwann39 (1810–1882) gave yeast its Latin generic name *Saccharomyces* in 1837 , which means sugar fungus. He supposedly chose the name because yeast reminded him of sugar crystals under a microscope. However, it was not until the French scientist Louis Pasteur (1822–1895) that he proved that yeast is not the result of fermentation, but rather its cause.40

The isolation of the yeast cell and the propagation of a pure yeast culture by the Danish microbiologist Emil Christian Hansen (1842–1909) in 1883, who worked as the head of the laboratory for the Danish brewery Carlsberg, contributed to the further growth of the quality and sensory purity of beer.41

The above-mentioned discoveries regarding yeast were a result of the Industrial Revolution. Yeast has been needed for brewing beer since ancient times, although people in the past had no idea of its existence. The deliberate fermentation in the production of various types of food was probably the first biotechnological invention of mankind. Anaerobic fermentation takes place without the participation of oxygen (e.g. alcoholic, butyric, lactic fermentation), aerobic in the presence of oxygen (e.g. citric, acetic fermentation).42 The same genus of yeast is used for beer production as in baking, distilling and winemaking , in Latin *Saccharomyces,* however, further subdivision of this group of yeasts is still the subject of taxonomic studies and various nomenclatures can be found in the lite

39 His contemporary was another German – the “discoverer” of the *pilsner* beer style, Josef Groll (1813–1887).
40 BARNETT, James, A., *A history of research on yeasts 2: Louis Pasteur and his contemporaries,* 1850±1880, Yeasts, 2000, 16, 8, p. 756.
41 RAY, Bibek – BHUNIA, Arun, *Fundamental Food Microbiology,* Boca Raton 2014, p. 6.
42 KODÍÿEK, Milan, *Biochemical terms: an explanatory dictionary,* available online: <http://147.33.74.135/knihy/uid_es-002/ebook.html?p=kvaseni> [15. 10. 2018].

yeast fermentation.43 Strains used in brewing and winemaking are, for example, able to survive higher alcohol concentrations. Brewer's yeast can be divided into two basic groups, bottom-fermenting yeasts and top-fermenting yeasts. Bottom-fermenting yeast *Saccharomyces pastorianus (Saccharomyces carlsbergensis)* is used in the production of *lager* -type beers in the temperature range of 7 to 15 °C with sedimentation of the yeast at the bottom of the container. Bottom-fermenting yeasts have been variously named: *Saccharomyces cerevisiae, S. pastorianus, S. carlsbergensis, S. monacensis, S. uvarum, S. cerevisiae subsp. uvarum, S. cerevisiae var. carlsbergensis* and now the name *S. pastorianus* is used.44 Top-fermenting yeast *Saccharomyces cerevisiae* is used in the production of lager-type beers *and* other types of beers with a temperature range of 18 to 22 °C, often with the yeast being carried out into a yeast blanket.45 They differ in type, especially in the form of metabolites they produce. For example, top-fermenting yeasts produce 4-vinylguaiacol, which is a substance with a sharp spicy aroma reminiscent of cloves, which is typical, for example, of top-fermented wheat beers.46

Today, bottom-fermented beers, which can be called *lagers,* dominate the world . Their rapid development occurred in the second half of the 19th century and was related to the invention of artificial refrigeration. Previously, breweries produced bottom-fermented beers only in the winter , or they could also produce them in the summer if they had sufficiently deep cellars carved into the rock with a constantly low temperature. It is often inaccurately stated that the inventor of bottom-fermented beer is Josef Groll, who brewed the first *pils* beer in 1842 at the then Burghers' Brewery in Pilsen. He applied the bottom-fermentation technology, which was already quite widespread in Bavaria at the time, but he used purely Czech raw materials to produce his *lager .* It is believed that bottom-fermented beers are healthier, or rather, they cause fewer headaches when consumed in large quantities than top-fermented beers. When using bottom-fermentation technology, a minimum of esters are produced.

However, the technology of bottom fermentation itself did not emerge until the 19th century. The Bavarian brewery Schlenkerla reports that old court documents from the city of Nuremberg from the 14th century record lawsuits from breweries without rock cellars against breweries with stone cellars regarding the illegal sale of bottom-fermented beer in the summer.47

43 BASAÿOVÁ, G. – ŠAVEL, J. – BASAÿ, P. – LEJSEK, T., *Brewing,* cd, p. 236.

44 MATOULKOVÁ, Dagmar – ŠAVEL, Jan, *Brewing and taxonomy of brewer's yeast,* Kvasný industry, 2007, 53, 7–8, pp. 2013.

45 BASAÿOVÁ, G. – ŠAVEL, J. – BASAÿ, P. – LEJSEK, T., *Brewing,* cd, pp. 239–240.

46 GALLONE, Brigita - STEENSELS, Jan - PRAHL, Troels - SORIAGA, Leah - SALES, Veerle - HER-RERA-MALAVER, Beatriz - MERLEVEDE, Adriaan - RONCORNI, Miguel - VOORDECKERS, Karin - MIRAGLIA, Loren - CLOTILDE, Teiling - STEFFY, Brian - TAYLOR, Maryann - SCHWARTZ, Ariel - RICHARDSON, Toby - WHITE, Christopher - BAELE, Guy - MAERE, Steven – VESTREPEN, Ke-vin J., *Domestication and Divergence of Saccharomyces cerevisiae Beer Yeasts,* Cell, 2016, 166, 6, p. 1405.

47 Schenkerla Brewery, The origins of Lager yeast – a theory, available online: <https://www.schlenkerla.de/rauchbier/lagerhefee.html> [4. 7. 2018].

Brewer's yeast under the microscope
Photo: *Dagmar Matoulková, Brewing and Malting Research Institute*

It is clear that the “primitive beers”, or rather the first fermented beverages from grains, were fermented spontaneously. Over the centuries, a certain selection and a kind of deliberate domestication and breeding of yeasts began to occur. Brewers increasingly avoided spontaneous fermentation and used a culture selected over generations from the previous batch. Some researchers state that one archaeological find proves that a certain primitive form of yeast selection existed as early as 1440 BC.48 The Schlenkerla brewery further states that with the emergence of monastery breweries in the 8th century, and thus a scientific and artisanal approach to brewing, spontaneous fermentation became very unusual.49 As the researchers further state, it was only in the 18th century that the drink began to resemble the style we know today, although it can still be said to have a proper pedigree.50

Beer has undergone incredible development over the millennia of its existence and is currently also changing under the influence of consumer preferences, especially under the influence of technological progress.

3.1 BOHEMIAN LAND

From a purely economic point of view, any smaller companies cannot compete on price (cost) with larger ones. Similarly, microbreweries cannot compete with industrial breweries. According to the economic rule of so-called increasing returns to scale, an increase in the volume of production factors used leads to a higher rate of growth in their returns.51 In practice, this means that larger companies (industrial breweries) are inherently

48 JACKSON, M., *Encyclopedia,* cd, p. 22.
49 Pivovar Schenkerla, The origins of Lager yeast – a theory, cd
50 JACKSON, M., *Encyclopedia,* cd, p. 7.
51 SAMUELSON, Paul A. – NORDHAUS, William D., *Economics,* Prague 1991, p. 483 and 983.

Brewery in Krupka around 1950
Source: *Pivovary.info, available online: <http:// www.pivovary.info/ gallery/ gal317_obr1225108059_188.jpg>* [14. 4. 2019].

more economically efficient than smaller companies (microbreweries) of their size. Industrial breweries are able to produce at lower costs per unit of production (say, per half liter of beer), and so can afford a lower price. Therefore, microbreweries can never compete on price with industrial breweries, so they choose other competitive strategies, such as product differentiation or innovation, which are associated with much greater flexibility.

Since the Middle Ages, there have been a huge number of small breweries in the lands of the Bohemian Crown, which corresponded in size to today's microbreweries. Their number grew rather slightly and peaked in the second half of the 16th century, when the ranks of brewing companies were at their "most sophisticated" and their network was at its densest.52

Microbreweries in the present sense of the word only began to appear in our country after 1990. However, small breweries from the past could also be called microbreweries in general – old breweries with legal rights, church and noble breweries, which until 1869 had a large monopoly on beer production. The owners of this monopoly propination right were called propináti. The market before this date was largely preserved and did not allow for much-needed development, cheaper production, etc. The number of breweries did not change significantly; there may have been around 1,400 in the lands of the Czech Crown at that time.53 The propination right also applied to producers of spirits. Act No. 55 of 1869 abolished the “exclusive right to guarantee

52 JÁKL, Pavel, *Encyclopedia of Breweries of Bohemia, Moravia and Silesia, Part II – South Bohemia,* Prague 2010, p. 7.
53 LIKOVSKÝ, Zbynÿk, *Czech Breweries 1869–1900,* Prague 2005, p. 6. and LIKOVSKÝ, Zbynÿk, *Breweries of Moravia and Austrian Silesia 1869–1900,* Prague 2000, p. 3.

to brew beer and distill spirits and sell both”, in Moravia this became Act No. 23 and in Silesia this Act No. 18.54 The brewing market was thus definitively freed from this truly medieval regulation and began to develop very expansively. Quite logically, the massive closure of small and often outdated breweries owned by propináts began. These breweries could not compete with the newly emerging and modern large breweries either in price or quality. However, in the mentioned period, the product also became even more homogenized, as breweries switched to bottom-fermentation technology or were closed down altogether. The last brewery to switch to bottom-fermentation technology was the Krupka brewery in 1884,55 which closed after 1939.56 The market was moving towards product unification and consumers did not demand any special beers . On the contrary, at this time, capital-intensive industrial breweries. The prominent Czech brewing expert of the time, Chodounský, stated: “The decline in breweries, which was already increasing year by year in these years, was due to the fact that the brewery equipment did not meet the requirements of brewing beer with bottom yeast.” He then added: “And so the intervention of machinery and of course also machine power is significantly increasing – and in 1871, out of 947 breweries in Bohemia, 51 were already equipped with machine power, in 1874 there were 29 more, in 1876 there were already 101 breweries operating, today there are 242 of them out of 614. in operation.” Despite the large[57] The development of the number of breweries in Bohemia is shown in grap decrease in the number of breweries in the period 1869–1914, this period is often referred to as the golden age of Czech brewing. There was enormous development , growth in production and, above all, an increase in quality in a relatively calm period without significant military conflicts. The result was a natural, yet historically cruel and, in the last period of the 19th century, a sharp decline, especially of small and primitively equipped breweries, which historically had already been completed by the previous decline of enterprises , gradually concentrated and closed by their own owners.58 Then everything ended with the First World War, during which copper breweries were often confiscated and used for the production of weapons.

The Czech brewing industry was dealt a severe blow to the number and quality of beer production not only by the two world wars, but also by the era of centrally planned economy. This led to the production of beer from various substitutes or the brewing of very weak beers. Within two years after the communist coup, a full third of breweries were closed. Of the approximately 280 breweries operating in 1948, a full hundred had closed by 1950. Breweries did not disappear in such a short period of time, even in the previous war era. The post- February period of red darkness brought absolute stagnation to the brewing industry.

54 SEDLÁÿEK, Jaromír, *Prohibition of tapping foreign beer in licensed breweries. (Contribution to the theory of legal entities.),* Brno 1930, p. 19.

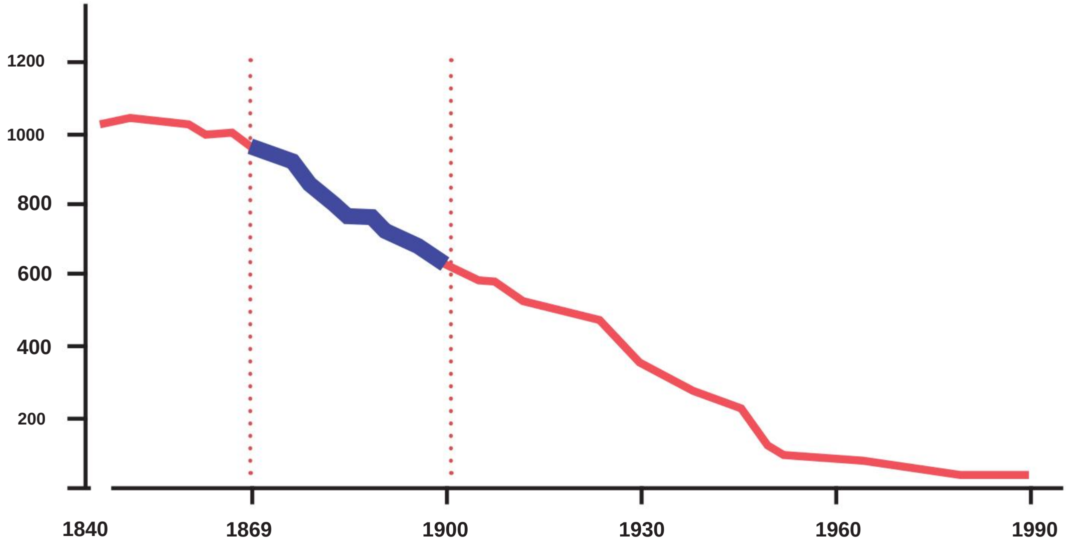
55 BASAÿOVÁ, G. – ŠAVEL, Jan – BASAÿ, P. – LEJSEK, T., *Brewing,* cds 100.

56 LIKOVSKÝ, Zbynÿk, *Breweries of the Czechoslovak Territory 1900–1948,* Prague 2006, p. 122.

57 CHODOUNSKÝ, František, *Brewing: Facsimile of the original edition from 1905,* Prague 2005, p. 8.

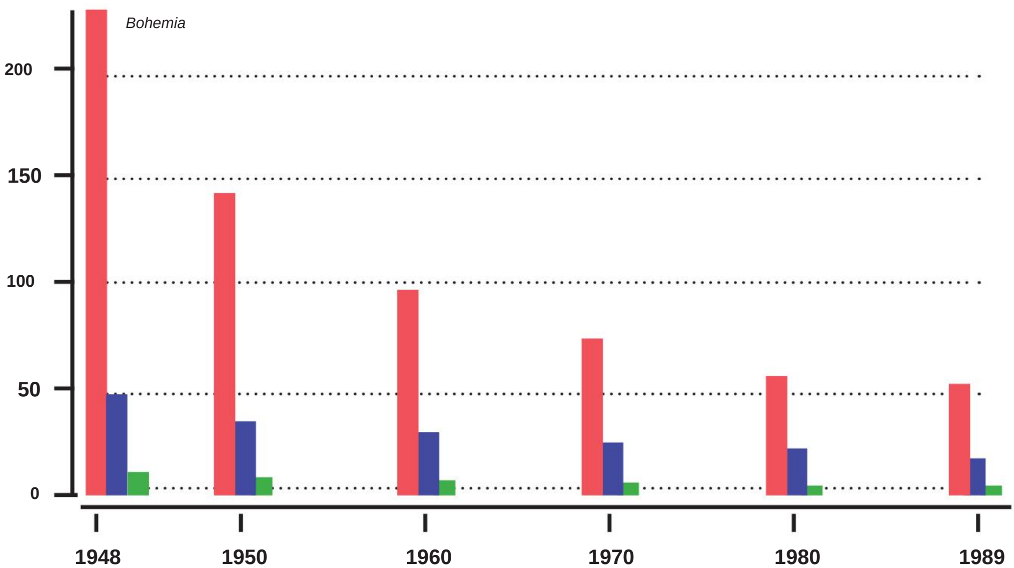
58 JÁKL, Pavel, *Encyclopedia of Breweries of Bohemia, Moravia and Silesia, Part I – Central Bohemia,* Prague 2004, p. 8.

Graph No. 1: Development of the number of breweries in Bohemia (excluding Moravia and Silesia) between 1840–1990



Source: *LIKOVSKÝ, Zbynÿk,* Czech Breweries 1869–1900, *Prague 2005, p. 6.*

Graph No. 2: Development of the number of breweries in the Czech lands in the years 1948–1989



Source: *LIKOVSKÝ, Zbynÿk,* Czech Breweries 1869–1900, *Prague 2005, p. 6.*

Bohemia

Moravia

Silesia

investments in technology and buildings.59 However, a small number of breweries were fortunate enough to have their buildings preserved and, after the conditions eased after 1990, production resumed in them.

The number of breweries continued to decline, with the exception of the Most-Sedlec brewery in 1976 (closed in 1998) and the Nošovice brewery in 1970. A change for the better , which liberalized the communist centrally planned economy, came only after the so-called Velvet Revolution. 70 industrial breweries and a small brewery (minibrewery) U Flekÿ survived the communist era. In 1991, the first real minibrewery was founded in Svinišÿany, called Meloun, but due to economic pressure it was closed in 1998.

3.1.1 MINIBREWERY AT FLEKÿ

In this monograph, it is impossible to avoid a legend among Czech breweries, or rather microbreweries, which is undoubtedly the microbrewery – a former legal brewing house – U Flekÿ . It is the only originally legal brewing house that still produces beer today . Zbynÿk Likovský's publication lists 63 small breweries in the then Prague (Hradÿany, Malá Strana, Staré Mÿsto, Nové Mÿsto and Josefov) as of 1869, most of which were legal brewing houses and small church breweries. These were gradually closed and only two survived the Second World War, namely the former U Flekÿ brewery and the U Svatého Tomáše church brewery, where beer production was terminated in 1951. The reason why the U Flekÿ microbrewery survived to this day is undoubtedly market-related. In 1869, the microbrewery, or rather the old legal brewery, was not unique at all, but after the Second World War it was able to use a business strategy of significantly differentiating itself from the competition and suddenly became rare in the eyes of consumers.

The oldest written mention of the U Flekÿ brewery dates back to 1499, but it can be assumed that beer was brewed here even before that year. In the past, the U Flekÿ brewery changed its name, being called Na Kÿemenci and U Domažlíkÿ. During the Thirty Years' War (1618–1648), it was plundered by the Swedish troops of General Torstenson. Reconstruction did not begin until 1675.60 In 1762, the brewery was purchased by Jakub Flekovský and his wife Dorota.61 They gave the brewery its current name; in the past, the brewery was also called U Flekovských. Until 1843, various types of top-fermented beers were produced here, then only a dark bottom-fermented *lager* of the Munich type began to be brewed here.62 The change was introduced by the brewer at the time, Friedrich Pštross. In 1920, he purchased

59 FRONÿK, Daniel – JÁKL, Pavel – STAREC, Milan – FRONÿK, D., *Beer & sugar. The balance of the disappearing of the mental era II,* Prague 2011, p. 7.

60 RAVIK, Slavomír, *Prague pubs: Stories about Prague restaurants, beer halls, wine bars, cafes, pubs and bars,* Prague 2006, p. 65.

61 MUSIL, Stanislav, *The Glory and Decline of Old Prague Breweries: Part 2 – Nové Mÿsto,* Prague 2013, p. 145.

62 RAVIK, S., *Prague Taverns,* cd, p. 166.

Washing out fermentation barrels in the yard of the U Flekÿ brewery
Source: *U Flekÿ Brewery Archive*

The entire house of Václav Brtník,63 the brewery is still owned by his descendants, the only exception being the communist era, when the brewery was nationalized. In the early 1950s, František Skolka became the head brewer here, having moved here from the recently closed former "minibrewery" U Svatého Tomáše. During brewing at the U Flekÿ minibrewery, Skolka used a number of unconventional processes, applied surrogacy in beer production (replacing part of the malt with sugar), often used hop extracts instead of hops. He used a cooler to color the beer. His successor Ivan Chramosil (head brewer from 1971 to 2015; i.e. more than 40 years) immediately removed all of the above from the technological process. Chramosil was succeeded by Michael Adamík, who belongs to the Brtník family.

The capacity of the entire restaurant currently stands at around 1,200 seats and the annual output ranges from 2,000 hl to 2,500 hl of beer. The brewery achieved its highest output in 1911/1912, namely 12,640 hl of beer.64 The restaurant's highest consumption was achieved on a summer day in 1974, when guests drank 54 hl of beer (10,800 beers) that day.65 In the years 1951–1993, it was the only microbrewery in Prague, and only in 1993 did the Prague Novomÿstský Brewery come into operation. By mid-2018, there were already more than 40 microbreweries in Prague.

63 POLÁK, Milan, *Prague Breweries and Breweries,* Prague 2003, p. 152.
64 LIKOVSKÝ, Z., *Breweries of the Czechoslovak Territory,* vol. d, p. 205.
65 POLÁK, M., *Prague Breweries,* cd, p. 156.

3.2 DEVELOPMENT OF MINIBREWERIES AFTER 1990

To create a breeding ground for the successful operation of microbreweries, the following three conditions must be met:

1. the possibility of private entrepreneurship and easy entry into the industry;
2. the existence of a group of consumers demanding the production of microbreweries;
3. higher purchasing power of the population.

The first condition was fulfilled after the fall of communism in 1989 and 1990, respectively, but the other two were very slow to emerge. During the communist era, consumers had virtually no contact with the developed Western world due to the Iron Curtain, and so were not familiar with beer styles other than dark and light *lager.66* According to statistics from the Czech Breweries and Malteries Association, in 1994, 97.2% of light *lager* and 2.8% of dark *lager were produced in the Czech Republic, and* top-fermented beers were not produced at all . Consumers were not familiar with, and therefore did not ask for, beers other than *lagers.* The purchasing power of the population was also complicated, as it increased only very slowly. From the above it follows that the first microbreweries certainly did not have an easy entry into the industry and at least in the first few years they actually operated in a common competitive ring with large industrial breweries, which they could hardly compete with on price. Since 1991, three development periods can be identified in the Czech microbrewery segment (1991–2004, 2005–2010, from 2011).

3.2.1 FIRST PERIOD (1991–2004)

This period can be called a pioneering period without exaggeration. Microbreweries produced almost exclusively bottom-fermented beers, brewers had minimal contact with colleagues from developed Western countries. That is why the “mortality” of microbreweries reached 25%, meaning that every fourth brewery that started brewing beer at this time disappeared. Brewers generally had no idea how to produce top-fermented beers, and consumers were very conservative. There were also no beer festivals focused on microbreweries. On the contrary, during this period, many home brewers started brewing beer, people began to experiment, which was a certain breeding ground for the further development of microbreweries. A certain disadvantage until 1995 was the absence of a progressive excise tax rate on beer, which only began to apply in 1996.

Microbreweries were directly competing with large industrial breweries. In 1995, a price war also began on the Czech beer market. The price of beer exceeded CZK 6,

66 The term *lager* here refers to a beer style, not a beer designation based solely on its strength, as stated until November 30, 2018, Czech law was somewhat problematic.

Kácov brewery tray from 1993
Source: *Author's archive*

but suddenly the price of the cheapest beers dropped to 3.90 CZK,67 which was often liquidation for the microbreweries of the time .

At first, microbreweries in our country were not pioneers of new beer styles. The first wheat beer was produced at the end of 1994 by the Domažlice brewery, owned by the Plzeÿský Prazdroj company. The wheat beer called Prior was probably the first Czech officially distributed top-fermented beer after 1884, when the Krupka brewery stopped using top fermentation. This innovation was noticeably ahead of its time at the time. The Domažlice brewery was closed in 1996 by its owner, Plzeÿský Prazdroj, who moved the production of this beer to the Karlovy Vary brewery, which three years later met the fate of its Domažlice group colleague. From Karlovy Vary, production moved directly to Pilsen, where this beer was produced until 2000 under the name Gambrinus Bílé.68 Its production did not last long, as the Czech market was not yet ready for similar types of beer. Among industrial breweries, the Primátor brewery in Náchod has been brewing wheat beer for the longest time in the Czech Republic, since 2003.

The first microbrewery to start brewing top-fermented beer in our country was probably the Pivovarský dÿm, after it opened in 1998. It was a Bavarian-style wheat beer. In the same brewery, experimental batches of *pale ale beer followed in 1999–2000,* which was developed there for the Náchod Brewery.

In the same period, pioneers of beer education were also becoming more visible. In Prague--In Holešovice, Petr Vaÿek opened the Beer Gallery, the first specialized store offering beers from smaller industrial breweries, not primarily

67 Bernard Family Brewery, 1991–2016 CELEBRATING 25, available online: <https://www.bernard.cz/file/edee/cs/epivovar/magazine/bernard_25let_dotisk_www.pdf> [11. 7. 2018].

68 PIVOVARY.INFO, History of Plzeÿský Prazdroj, available online: <http://www.pivovary.info/prehled/prazdroj/prazdrojfuze_h.htm> [5. 7. 2018].

from microbreweries. It also included a small pub. This Beer Gallery was opened on May 2, 2001,69 and closed in August 2017.70

Pivní kurýr, published since 1990 by Richard Crha and Pavel Jákle, was the first magazine on our market to systematically promote beer diversity.

The publication was published monthly, occasionally bimonthly. The magazine was published at regular bimonthly intervals from July 2005 until it succumbed to the pressure of the increasingly widespread Internet in 2008. The subtitle of this publication was somewhat curious – Notorious Journal of the Czech Crown.

The first targeted and at the same time widely publicized internet beer education came slowly in 2001 with the person of Jan Koÿka and the launch of his website svetpiva.cz . At the time, Jan Koÿka worked as a steward in air transport and on his travels had the unique opportunity to get to know various beer styles and beer culture , which he greatly missed in the Czech environment. His website often featured authored articles about emerging microbreweries, amateur contributors generally uncritically evaluated unfiltered beers from microbreweries and praised them above industrial beer production. An internet community of beer fans began to emerge. This was also the impetus for organizing lectures and moderated tastings for consumers. The very first homebrewers' meeting, called the First Homebrew Workshop, which took place at the beginning of 2005, was very important for the future development of homebrewing.

It is also worth mentioning that in 2004, the first beer hall in our country focused on beers from small (but still industrial) breweries was opened in Olomouc, U Kudÿje, and the Prague pub První pivní tramway began to rotate beers from smaller breweries on its fourth tap.

It is characteristic of this period that the vast majority of microbreweries were also restaurants. The only exceptions were microbreweries that were more like advanced homebrewing, such as Sentický kvasar and Svatý Ján in Polepy u Kolín. The opening of the Želiv Monastery Brewery in 2003 was somewhat unconventional, which was the first newly opened church brewery in the Czech Republic in more than a century. However, the beer was produced there from concentrate and the brewery also did not have its own restaurant. The switch to classic beer brewing was only made after reconstruction in 2011. The first typical non-restaurant microbrewery was the Bon Zašová microbrewery in 2004, which, however, supplied beer to some of its own network of gambling dens and bars.

At the end of this period, in 2003, the consumer organization Sdružení pÿátel piva (Association of Beer Friends) became active again. It has its roots in the recessionist Party of Beer Friends, which was founded in 1990 by students of the Faculty of Education in Pilsen. In 1997, due to overwhelming electoral setbacks, the party transformed into an apolitical association, but it did not develop any intensive activity. The situation changed

69 ZÁVOZDA, 1. Beer Gallery, available online:
<http://www.zavozda.cz/pivnigalerie.php/cz_pgalerie.php> [5. 7. 2018].
70 Beerborec, Beer Gallery, available online:
<http://beerborec.cz/page.php?page=hosp_detail&pub_id=398&pic_id=-1> [5. 7. 2018].

Beer Friends Association logo
Source: *Association of Beer Lovers, available online: <http:// www.pratelepiva.cz/ logo2.gif>* [14. 4. 2019].

Logo of the European Beer Consumers Association
Source: *European Beer Consumers Association, available online: <https:// www.ebcu.org/ wp-content/ uploads/ 2016/04/ ebcu_logo.png>* [14. 4. 2019].

It was in 2003 that Tomáš Erlich took over as head of the association. He gradually began to rebuild the Association of Friends of Beer into a successful and respected consumer organization that holds its own tasting competition and organizes a number of excursions and trips related to beer for its members, both in the country and abroad. One of the goals of this organization is to "use its influence to strive for the greatest possible diversity in the beer market, to preserve the maximum number of existing breweries and to create new ones."71
In 2005, the Beer Friends Association became a member of the prestigious European Beer Consumers Union (EBCU).

In 1991, the oldest domestic beer tasting competition (connected with the festival) was established, called the Golden Beer Seal, originally focused only on large breweries.
Since 2004, the situation has gradually changed and the competition has been much more open to microbreweries . The event was traditionally held in Tábor, but since 2016 it has been moved to ÿeské Budÿjovice.

The very first modern microbrewery in the Czech Republic was founded in 1991 in Svinišÿany (Náchod district). It was established in the U Lípy restaurant and was named Meloun after its founders – Milan and Bohuslava Meloun. Milan Meloun had extensive experience in the hospitality industry. After opening his microbrewery, he cooperated with the nearby Primátor brewery in Náchod. It was not a typical restaurant microbrewery; relatively larger quantities of beer were consumed elsewhere than in the restaurant itself. Beer was also supplied to a restaurant located on a steamer anchored in Prague on the Vltava River, and a smaller quantity of beer was even bottled. The technology was supplied by the ZVU Hradec Králové company. The brewery

71 Association of Beer Lovers, Statutes, available online: <http://www.pratelepiva.cz/sdruzeni/stanovy/> [28. 9. 2018].

Postcard of the Meloun microbrewery from the mid-1990s
Source: *Author's archive*

Initially, it produced around 1,500 hl per year, later 3,000 hl per year. It only produced bottom-fermented beers, namely light beers with an ABV of 10.5 and 12 and a dark 14. It differed from traditional breweries only in that the beer was unfiltered. Interestingly, unlike most microbreweries, it did not use water from the public water supply, but from its own well. Fermentation took place in closed tanks, not in an open cellar. The brewers here were Josef Balounek, Václav Kovaÿík and Roman Doležal. In 1998, the microbrewery was closed for economic reasons due to investment over-lending and excessively high interest rates, which at that time reached double digits.

In 1991, a microbrewery in Babice also started brewing beer. However, it was more of an advanced homebrewing operation, run from 1991 to 2002 by a group of students. The beer was called Mokváÿ. In 2008, there was news that the microbrewery might be revived,72 but in the end, this did not happen.

The oldest functioning microbrewery as of mid-2018 was the Pivovarský dvÿr Chýnÿ, a relic of the pioneer period founded in 1992. The then Flekovský brewer Ivan Chramosil helped to start production here. The brewery is located in the building of the former unified agricultural cooperative. However, in the second half of 2018, it temporarily suspended production due to disputes between the owner of the premises and the brewer . The oldest production brewery as of the end of 2018 was the Pegas microbrewery in Brno, also opened in 1992.

Part of the active modern history of microbreweries are also breweries that began to renew their production after several decades. These were usually breweries that

72 PIVNÍ.INFO, Babický brewery is slowly coming back to life…, available online: <https://pivni.info/minipivovary/348-babicky-pivovarek-pomalu-opet-oziva.html> [20. 10. 2018].

Brewery of the Chýnÿ Brewery
Source: *Pivovary.info, available online: <http:// www.zpravy.pivovary.info/ wp-content/ gallery/ galerie-minipivovaru-chyne/ chyne_varny-1.jpg>* [14. 4. 2019].

which were purposefully closed in the 1950s with the advent of a centrally planned economy. The first (mini)brewery to be revived in this way was the brewery in Kácov, where Jiÿí Kapinos and Václav Šindýlek resumed production in 1993 after 37 years.

3.2.2 SECOND PERIOD (2005–2010)

During this second period, the "mortality" of microbreweries dropped to around 10% and many breweries began to produce top-fermented beers. Consumer demand began to change, also because many consumers were already familiar with foreign top-fermented beers. In 2008, the Sun in Glass beer festival was founded, which focuses only on microbreweries and takes place every year in September in Pilsen-ÿernice. During this period, a specific beer community seeking diversity also expanded even further . For this community, the establishment of each new microbrewery was news of fundamental importance, since their mass growth had not yet occurred.
The owners of microbreweries were mostly enthusiasts, with only a few exceptions professional investors entering the microbrewery sector. It is also worth mentioning that in 2007 the first tasting of homebrewers took place, organized by the aforementioned Jan Koÿka. The event took place at the Secondary Industrial School of Food Technology in Podskalská Street in Prague.

Sun in Glass beer festival logo
Source: *Sun in a glass, available online: <http:// www.minipivo.cz/ base/ files/ images/ 810711/41802-logo_Sun-in-glass_ nove_800x800.jpg>* [14. 4. 2019].

The first domestic tasting competition focused only on microbreweries is the Spring Award of Czech Brewers, which has been held in Zvíkovské Podhradí (Pivovarský dvýr Zvíkov) since 2007. This competition was created by the bimonthly magazine Pivní kurýr (or rather the company PIVAS) and was intended for breweries with a production capacity of up to 5,000 hl. However, at the end of 2008, the Beer Courier ceased to exist and was later organized by the Bohemian -Moravian Association of Minibreweries. Minibreweries with an annual production of up to 10,000 hl can participate , which is also the upper limit of production limiting the entry of minibreweries into this association.

The period is also characterized by significant hostility between the industrial breweries and microbreweries segments , as both sides have not yet fully understood the broad possibilities of coexistence. At the beginning of this period, in 2005, the Brewery Club was opened in Karlín, Prague, becoming the first enterprise to

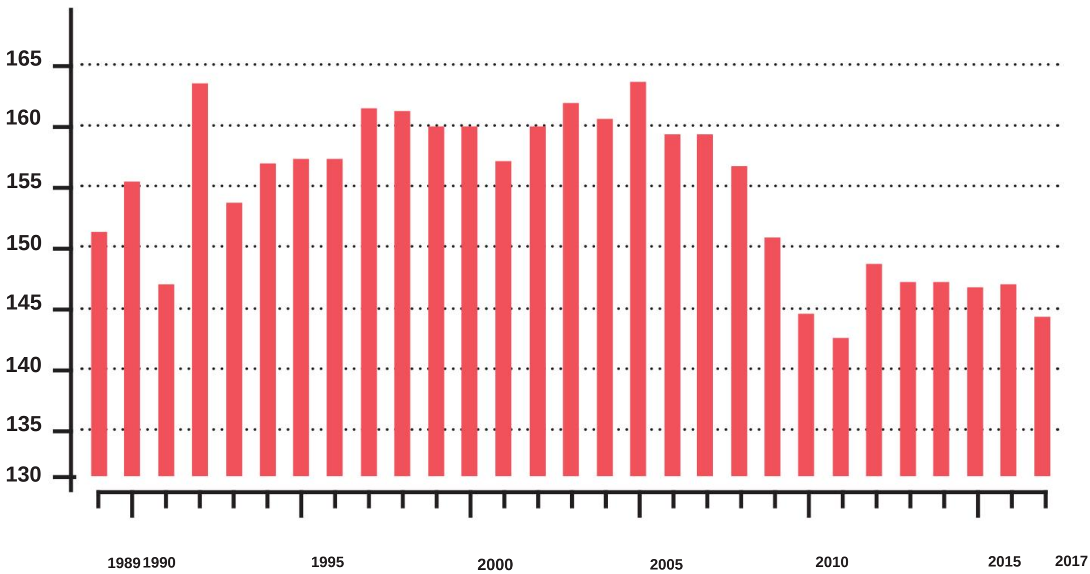
Covers of both issues of Pivaӱ magazine
Source: *Private archive of Jan Koӱka*

alternating several beers on tap in the Czech Republic, most of which came from microbreweries. Subsequently, a number of other similar establishments were opened.

In March 2006, another attempt at a printed magazine with a beer theme appeared, which naturally also included information about microbreweries. The magazine Pivaÿ with the subtitle Magazine about beer culture, published by beer visionary Jan Koÿka, however, had a short life of only two issues.

The end of this period, with the onset of the economic crisis, was also characterized by a significant decline in beer consumption in the Czech Republic and a simultaneous increase in beer imports, especially from Poland and Hungary. However, as will be discussed later, it was microbreweries that weathered the crisis best.

Graph No. 3: Beer consumption in the Czech Republic per capita (l/year)



While in 2008 per capita consumption was still 157 liters, in 2009 it fell to 151 liters and in 2010 to 144 liters, as is evident from graph no. 3. This drop in consumption concerned only and only large industrial breweries; it did not have a negative impact on microbreweries at all, quite the opposite. For microbreweries, this meant a boost . The largest declines in sales were recorded by the largest breweries, led by the market leader – Plzeÿský Prazdroj. Within a few years, its share of domestic beer consumption fell from 49% to 42%, which meant a huge loss of profit for the company . From a marketing point of view, Plzeÿský Prazdroj's reaction was quite aggressive.

At the end of March 2010, the company launched a campaign called "For Clean Czech Beer", in which it made a very negative point about breweries that used a substance called tetrahop, which is permitted in the food industry and has a positive effect on the stability of beer, in the production of their beers.

foam. Plzeÿský Prazdroj thus turned against itself practically all breweries and not only those that used the product. The then chairman of the Czech Association of Breweries and Malteries, František Šámal, called on Plzeÿský Prazdroj to immediately stop the campaign, which was damaging the entire industry. He also threatened to expel Plzeÿský Prazdroj from the association if it continued its campaign, presented as a fight against chemicals in beer.73 Several breweries subsequently left the association in protest against Plzeÿský Prazdroj. After a few days, Plzeÿský Prazdroj stopped the campaign, in particular by cancelling the website zacisteceskepivo.cz. The reason for this aggressive behavior was apparently an attempt to reach the beer sales figures before the economic crisis broke out in 2008.

The Plzeÿský Prazdroj company subsequently stopped supplying yeast to microbreweries overnight in September 2011,74 while two months earlier (July 2011) it had stated in its press release that it was supplying raw materials to microbreweries. The then head brewer of the Gambrinus brewery (part of the Plzeÿský Prazdroj company) even stated that the microbreweries were using yeast that had already fermented Gambrinus beer, and that as a brewer he saw these supplies to microbreweries primarily as collegial assistance.75 The Bernard Family Brewery immediately took advantage of this step in marketing when it announced that it would begin to supply yeast to smaller producers without restrictions.76

At the end of this period, there was also a certain generational change of consumers, and the phenomenon of so-called regulars, which was so popular with the older generation born just after the Second World War, was no longer so popular. This generation was leaving the economically active life, or was already leaving for eternity. The new generation was looking for a greater variety of beer, and was only very rarely loyal to one pub or one brand, as was common among the previous generation. However, all of this was also related to the generally accelerating pace of life, greater workload and also the increase in motoring, and thus a shift away from the consumption of beer as an alcoholic beverage. On the other hand, the consumption of non-alcoholic beer was growing, although it did not fully cover the decline in the consumption of alcoholic beer.

Beer consumption in 2012 and later was undoubtedly helped by the outbreak of the so-called methanol affair, when after a series of methanol poisonings, the consumption of distilled spirits decreased and a certain substitution effect occurred. Consumers began to replace distilled spirits to some extent with beer or other types of alcohol. According to the Czech Statistical Office, beer consumption per person in 2011 was 142 liters, and in the following year it increased to 149 liters. In contrast, consumption of distillates decreased from 6.9 liters to 6.7 liters.

73 KamNaPIVO, The campaign “For clean Czech beer” ends, available online: <http://www.kamnapivo.sk/webtron/kampan-za-ciste-ceske-pivo-konci.html> [14. 11. 2018].

74 HOSPODÁÿSKÉ NOVINY, Plzeÿský Prazdroj has cut off small breweries from yeast. They have to buy it in Germany, available online: <https://byznys.ihned.cz/c1-52726670-plzensky-prazdroj-odrizl--small-breweries-from-yeast> [9. 12. 2018].

75 Plzeÿský Prazdroj, Gambrinus supplies raw materials to microbreweries, available online: <https://www.prazdroj.cz/996-gambrinus-dodava-suroviny-minipivovarum> [9. 12. 2018].

76 ECONOMIC NEWS, Bernard will supply yeast to small breweries, available online: <https://archiv.ihned.cz/c1-52764490-kvasnice-doda-malym-pivovarum-bernard> [9. 12. 2018].

3.2.3 THIRD PERIOD (FROM 2011)

The last period can be characterized by the interest of private investors in the microbrewery sector , and a number of owners or operators of existing restaurant facilities have also entered the sector. The decrease in microbreweries in the period 2011–2015 fell to 2.5% and microbreweries have become a distinct brewing market segment. The education of brewers became a major problem, as the Czech education system was not prepared for such an increase in the number of brewing operations, for example, 50 new microbreweries were opened in 2013. The period was also characterized by a more massive reopening of smaller industrial breweries that had been closed during the communist era or shortly before. Some of the breweries thus revitalized were put into operation with the help of financial support from the EU.

Large industrial breweries perceived the growing demands of consumers and had to start taking the microbrewery segment seriously, which is why they also resorted to a number of innovations and various marketing campaigns. A good example is the creation of the fictitious microbrewery Patron in 2015. This was a carefully prepared marketing campaign by Plzeÿský Prazdroj, when consumers were finally told that Patron beer was not from a microbrewery, but was in fact unfiltered Gambrinus beer.

Logo of the Czech-Moravian Association of Microbreweries
Source: *Czech-Moravian Association of Minibreweries, available online: <http:// www.minipivo.cz/ base/ files/ images/ 810711/ logo.png>* [14. 4. 2019].

An important event was the establishment of the Czech-Moravian Microbrewery Association in 2011. This professional organization brings together beer producers with an annual output of up to 10,000 hl. The most visible activity for consumers is the annual Microbrewery Tasting Festival at Prague Castle, the first year of which took place in 2012.

In 2011, the monthly magazine Pivo, Bier & Ale began to be published, which is the only magazine in the Czech Republic focused on beer and beer culture. In this sense, the Czech Republic still has a lot to catch up on; in developed brewing countries, a whole range of periodicals focused on this direction are published (see Chapter 5). The magazine also awards its so-called annual awards to selected entities. A certain negative side of these announcements is the very high number of sometimes difficult-to-grasp categories in which beers are awarded, which leads to a significant reduction in the value of such awards. For example, in 2

Cover page of the first issue of the magazine Pivo, Bier & Ale
Source: *Pavel Borowiec, Pivo, Bier & Ale magazine, 2011*

awards were given in the categories Best New Pale Lager 12° of 2018 (category no. 3) and Best New Pale Premium Lager 12° of 2018 (category no. 4), and it is not at all clear what the difference is between them. Also, four categories no. 38 to 41 (it is worth noting that the number of all categories goes into the tens) have the same name – Award for Long-Term Beer Quality.77 In a discussion on the beer website , a discussant under the “nickname” Chody stated somewhat cynically: “There should also be an award for inventing prices…”[78]

The third period is also characterized by the fact that the segments of industrial breweries and microbreweries began to cooperate and respect each other. Industrial breweries began to enrich their product portfolio much more with beer styles that had until then been the domain of microbreweries. Market leader, Plzeÿský Prazdroj launched the Brewers' Choice project in April 2015. In selected restaurants participating in the project, less common beers such as *IPA, saison* , etc. were alternated on one tap every month. These were beer styles that consumers knew mainly from microbreweries. In November 2018, Plzeÿský Prazdroj went even further when it publicly announced its cooperation with the microbrewery Matuška and offered a lager hopped with American hops as part of the Brewers' Choice. Budweiser Budvar was the first Czech industrial brewery to start distributing beers from a microbrewery. In June 2018, he released beer from the Sokolovské brewery Permon on his taps.

77 Pivo Bier & Ale, Annual Pivo, Bier & Ale Awards 2018 – results list, available online: <https://pivobierale.cz/tradice/vyrocni-ceny-pivo-bier-ale-2018-vysledkova-listina/> [15. 12. 2018].

78 Pivni.info, PBA magazine awards ceremony, available online: <https://pivni.info/udalosti/2003-nadilka-cen-casopisu-pba.html> [15. 12. 2018].

Permon brewery logo
Source: *Permon Brewery, available online: <http:// pivopermon.cz/ wp-content/ uploads/ 2018/02/ logo35468.png>* [14. 4. 2019].

The market share of microbreweries and their economic power still remain almost insignificant, with a market share of 2.02% in 2017. However, thanks to several factors – notably flexibility, uniqueness, almost unlimited innovation possibilities and minimal marketing costs – they have a huge competitive advantage over industrial breweries.

Flexibility

Like many smaller manufacturing companies, microbreweries, unlike large players on the market, have the ability to change their product portfolio very quickly. These entities are limited only by the length of the beer production cycle, which lasts from weeks to months, depending on the specific type of beer. In general, it can be stated that the stronger the beer, the longer it takes to produce it. Large breweries, on the other hand, are not as flexible in decision-making, and moreover, they are bureaucratic organizations in which the main and final word in production planning is usually economics or marketing, while in a microbrewery it is most often production (brewers). Microbreweries and craft breweries usually show greater flexibility also thanks to their product portfolio, because they produce top-fermented beers much more often, the production of which takes an incomparably shorter time compared to bottom-fermented beers.

Uniqueness

Products from smaller food operations are inherently unique, as they can usually only be purchased in a few places, and when consumed, they are considered rarer. Successful and expanding microbreweries that already have their own restaurant network sometimes face the problem during their expansion that their product is no longer perceived as something unique. They have to try their best to create in consumers the feeling that it is still a completely unique product. On the other hand, microbreweries often face capacity problems. Especially in the summer months, when demand is highest, some producers release young, unaged beers onto the market, which has a negative impact on the quality of the drink and can spoil their reputation.

Unlimited innovation

Microbreweries are by their very nature experimental breweries, and consumers often forgive them for mistakes that would not be tolerated by the big players on the market. They have almost unlimited possibilities for experimentation when it comes to technological the production process and the composition of raw materials. The ever-expanding number of permitted hop varieties, not only in the Czech Republic but also abroad, is a major factor in this. In 2018, a total of thirteen permitted hop varieties for commercial cultivation were registered in the Czech Republic, which is a completely different situation compared to the early 1990s, when only the Žatecký poloraný ÿerveÿák variety was permitted, which largely preserved the entire hop growing and brewing sector. The willingness of hop growers to change was practically zero at that time, and it only increased due to economic pressures and a significant drop in demand for this variety. It can be noted that in the second half of the 1990s, the entire sector collapsed, when hop production fell by up to 2/3 compared to the situation at the turn of the 1980s and 1990s. The monopoly of the Žatecký poloraný ÿerveÿák variety then fell in 1994, when the Žatecký poloraný ÿerveÿák and bor varieties were registered.

Minimal or no marketing costs

Each microbrewery is based on its uniqueness, and therefore uses marketing tools minimally (perhaps with the exception of social networks). Unlike a larger brewery, a microbrewery does not have to massively promote a new product. In recent years, microbreweries have been greatly helped by social networks and specific consumer communities that are keenly interested in brewing events, the same applies to specialized Czech beer websites, which are mainly:

ÿ pivni.info
ÿ breweries.info
ÿ pivniobzor.cz
ÿ ceskepivo-ceskezlato.cz
ÿ pivnici.cz

Historically, the first significant website was probably pivovary.info, but it was svetpiva.cz, which was launched in 2001 by the aforementioned Jan Koÿka, that attracted greater reader attention . For approximately ten years, it was the most visited website of this type. In 2018, it was no longer updated.

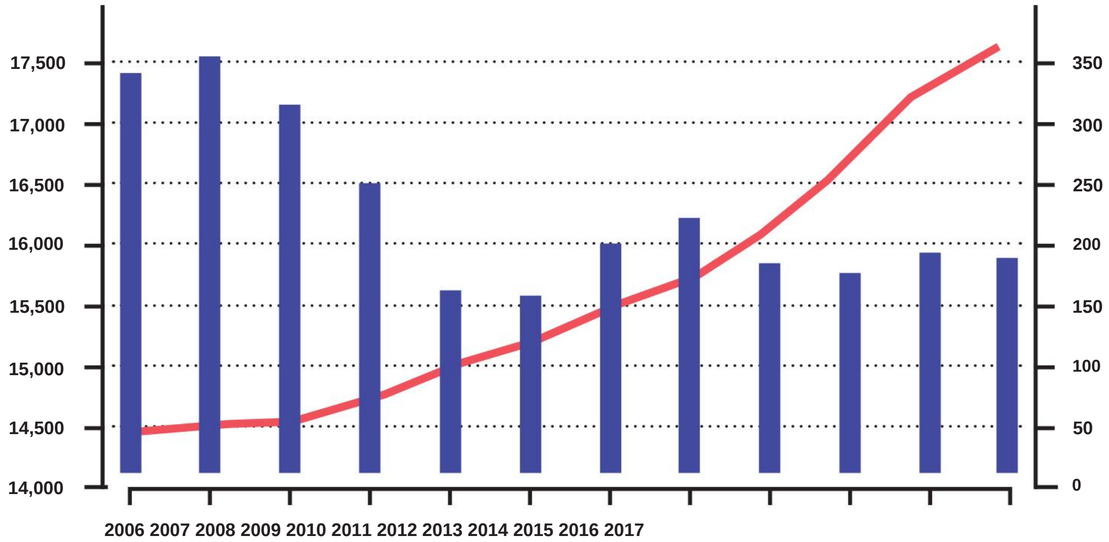
Another phenomenon of this period is the emergence of beer-focused mobile phone applications , helping consumers navigate the increasingly diverse market for this beverage.

Microbrewery production has increased more than tenfold in twelve years (from almost 31 thousand hl in 2006 to 320 thousand hl in 2017), which is shown in Chart 4.

Graph No. 4 shows all production, including that exported by microbreweries abroad. However, microbreweries do not export purposefully, which is related, among other things, to their size and short shelf life of production (they almost always produce unfiltered and unpasteurized beers), so the impact of exports can be considered negligible. In the period under review, the entire domestic brewing market recorded a significant decline in consumption, mainly due to the economic crisis, but the segment

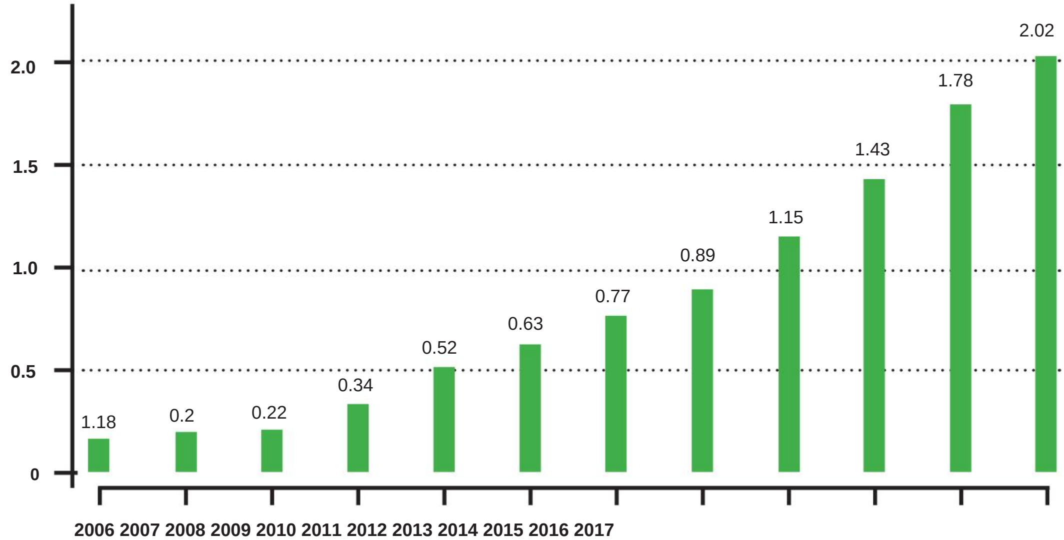
Machine Translated by Google

Graph No. 4: Development of domestic beer consumption and microbrewery production (thousands of hl)



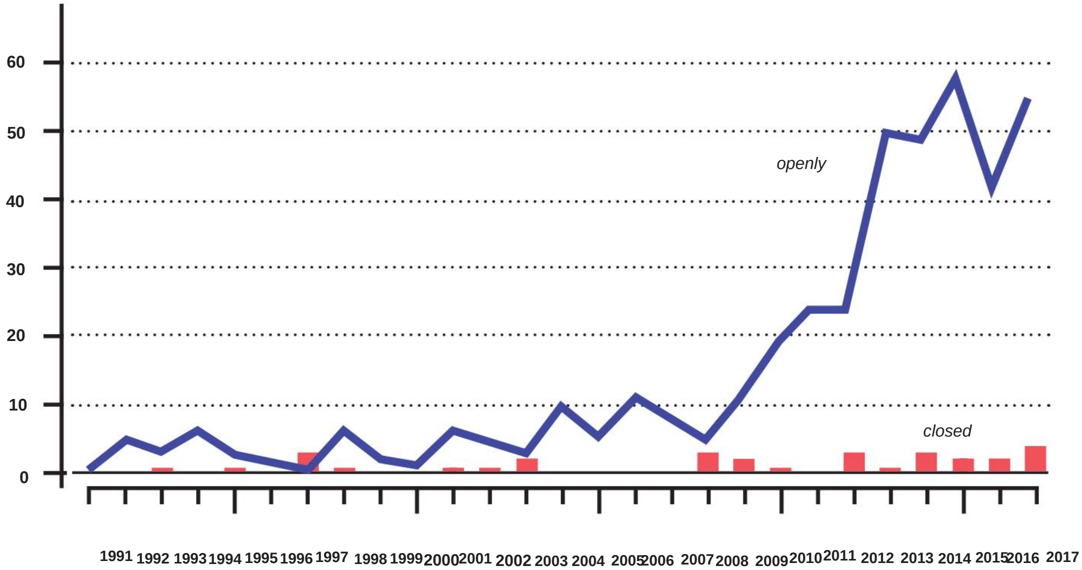
Source: *Customs Administration of the Czech Republic and Czech Statistical Office*

Chart No. 5: Development of the market share of microbreweries in 2006–2017 (%)



Source: *Customs Administration of the Czech Republic and Czech Statistical Office*

Chart No. 6: Overview of microbrewery establishment and closure



Source: *Breweries.info*

Microbreweries were not affected by this negative phenomenon at all. On the contrary, even during the most crisis period, the number of microbreweries and thus their production increased significantly. However, it should also be noted that some successful microbreweries exceeded the production limit of 10,000 hl in the given period and thus fell out of the category of the lowest tax rate (and according to our criteria, also out of the category of microbreweries).

With the values of the absolute indicator of annual exhibitions of microbreweries, their relative importance also grew sharply. Although it is customary to state that the market share of microbreweries is negligible, its increase by one order of magnitude during the monitored period is nevertheless respectable . According to graph no. 5, it is clear that microbreweries broke through half a percent of the market share in 2010, in 2017 they already had a market share of 2.02% and it is expected that this growth will continue. The segment is also specific in that individual restaurant microbreweries do not essentially compete with each other, and the sharpening of specific competition between them can sometimes be observed in various specialized beer bars that offer their beers. Thus, microbreweries that are significantly oriented towards selling their production outside their own premises, i.e. non-restaurant type microbreweries, compete with each other .

The record year for the establishment of microbreweries in the period 1991–2017 (Chart No. 6) is 2015, when a total of 58 microbreweries were opened. At the same time, many microbreweries were closed in this year (4). In terms of microbrewery closures, individual years are quite incomparable, as the number of microbreweries is constantly growing.

The relatively worst year was 1997, when 14% of the microbreweries opened up to that time (3 out of 21) left the market. If we take into account how many microbreweries ceased to function at that time,

Annual production of the Primátor Brewery (2018)
Source: *Primátor Brewery*

microbreweries, this is 16% (3 out of 19). However, the source pivovary.info does not take into account operations that started as microbreweries and, thanks to growth, exceeded an annual production of 10,000 hl, it still considers them to be microbreweries, and it also does not count non-commercial experimental and laboratory breweries among microbreweries .

Larger industrial breweries, or rather brewing companies, are also trying to capture the increase in beer diversity and respond to it with innovations. In order for the production of new beer to be profitable, they usually have to support sales through marketing, which carries significant risks of return. In 2018, Pivovary Lobkowicz had the widest portfolio. It included seven rather regional breweries, so the value of 48 produced beers (including two *radlers)* is slightly misleading. Nevertheless, this number is high given that the company operates in the same “competitive ring” as Plzeÿský Prazdroj, Pivovary Staropramen and Heineken. Pivovary Lobkowicz beers thus somewhat lack a certain imaginary hallmark of uniqueness that is characteristic of microbreweries.

The industrial operation with the broadest and most diverse portfolio is the Primátor Brewery, which produced fifteen beers year-round in 2018, not including seasonal or one-off beers. The Náchod brewery was the only industrial operation to cover almost the entire range of basic beer styles and beer styles that are more or less common in microbreweries.

Kácov Brewery
Photo: *Author's archive*

3.2.4 MICROBREWERIES OF 2017 IN NUMBERS

It is almost unbelievable that between 2013 and 2017, an average of one microbrewery was established every week in the Czech Republic. An overview of the establishment of the number of microbreweries is documented in Chart No. 6, including the output from the industry. This can be of two types:

1. bankruptcy, i.e. closure of operations;
2. economic success of the microbrewery and increase in annual production to over 10,000 hl.

The most common case of exit from the industry is economic reasons, when a brewery goes bankrupt and is closed. However, the equipment and facilities of such a brewery do not disappear, of course, because they still have their economic value, and so they are bought and transported elsewhere, where they begin to serve their purpose again. Sometimes the entire operation can be moved by the owner to other premises, as an example of which is the relocation of a microbrewery from Oslavany to Bratÿice.

The second case, i.e. an increase in production above 10,000 hl per year, is not so common, because breaking into the market with a larger volume of production is very problematic. As the volume grows, a microbrewery faces more intense competition from larger players and usually loses some of its rarity. The 2018 Brewery Calendar lists the following breweries for 2016, which exceeded the annual production limit of 10,000 hl between 1990 and 2017. The volume (in hl) for 2016 is always given in brackets:

Machine Translated by Google

Brewery lager tanks Chotebor
Photo: *Author's archive*

1. Breclav (19,000)
2. Chotebor (21,881)
3. Kácov (36,281)
4. Corner in Šumava (12,000)
5. Kutna Hora (15,000)
6. Unetice (12,500)
7. Rakovnik (116,608)
8. Wrocÿaw (105,000)79
9. Vojkovice [80]

In almost all cases, these are reopened breweries continuing a forcibly interrupted tradition of brewing beer. Of the above list, only the brewery in Chotÿboÿ was built on a green field, in all the others production was terminated or suspended for some time. In the case of Rakovník and Vratislavice, the suspension of production was only for a few years and its renewal was carried out in the existing facility,

79 ÿERNOHORSKÁ, Marie, Directory, in FRANTÍK, František (ed.), *Brewery Calendar 2018,* Prague 2017, pp. 125–154.

80 The Koníÿek brewery in Vojkovice exceeded the 10,000 hl mark in 2017, a year earlier it had a production of 9,900 hl.

Herold Brewery Bÿeznice

Source: *Bÿeznice Castle, available online: <https:// www.zamek-breznice.cz/ website/ var/ tmp/ image-thumbnails/ 30000/38874/ thumb__HeaderImage/ pivovar-web-novy.jpeg>* [14. 4. 2019].

All other breweries were supplied with completely new equipment and the non-production era lasted longer, on the order of several decades.

On the other hand, the annual production of the Herold Bÿeznice, Broumov-Olivÿtín and Podkováÿ breweries fell below 10,000 hl, which would have met the criteria for classification as microbreweries ; moreover, the Herold brewery was already a member of the Czech-Moravian Microbrewery Association in 2018.

Of the total number of 386 microbreweries, 35 were in some way put into operation in a building where beer was previously produced. Here too, we encounter problems with the definition. For example, the current production of the Bÿevnov Monastery is not considered to be renewed production, because the original brewery, which was closed down in 1889,81 was located in a completely different, now demolished part of the monastery; the current microbrewery is located in the former stables.

If a microbrewery was opened in premises where beer had already been produced in the past, it was usually an industrial brewery from the second half of the 19th century , which fell victim to a centrally planned economy. In the past, beer production was gradually concentrated in larger enterprises and small breweries died out without respect for tradition. Centuries-old economic ties were broken according to a predetermined plan. At this time, breweries closed or were demolished for various reasons , and the resulting gaps are in many cases a reflection of foolish haste, resentment, anger,

81 LIKOVSKÝ, Zbynÿk, *Czech Breweries 1869–1900,* Prague 2005, p. 23.

Table 1: Number of microbreweries in individual regions as of December 31, 2017

	Number of microbreweries per million inhabitants	Microbreweries total
Pilsen	63.70	37
Highlands	49.12	25
Olomouc	47.38	30
South Moravian	42.26	50
South Bohemian	42.17	27
Hradec Králové Ústí	41.74	23
nad Labem	35.32	29
Moravian-Silesian	33.17	40
Zlínsky	30.87	18
Karlovy Vary	30.44	9
Central Bohemian	28.83	39
Prague	27.81	36
Pardubice	25.08	13
Liberec	22.66	10
Total	**36.38**	**386**

Source: *Own calculation*

unfavourably or just unwillingly.82 However, a number of renovated breweries remain in the buildings of originally much more capacious breweries in the production category of up to 10,000 hl, but they are credited with preserving historical buildings, and these are often magnificent industrial buildings. Perhaps the best example is the Lobeÿ brewery. The core of the existing building, a two-nave vaulted threshing floor, dates from the early 17th century. The small rural nobleman's brewery was rebuilt into an industrial type of steam engine brewery at the end of the 19th century. Beer production in Lobeÿ ended in 1943, and only a bottling plant for Podkováÿ beer and a malthouse operated in rented operation continued to operate there. In 1948, the brewery was nationalised and the production technology scrapped. For the next few decades, it was used by the state as warehouses, workshops and garages. A period of ruin and decay ensued.83 Since 2007, the brewery has been gradually reconstructed, and the first batch of beer was brewed there in 2015.

Another type of return of beer brewing to its original location is represented by the Prague microbrewery U Medvídkÿ. In the past, it was a classic licensed brewery that left the market in 1898 under economic pressure. In 2004, production was resumed there.

Of course, microbreweries are not evenly distributed in our territory. The largest number of microbreweries is in the South Moravian Region, where there were 50 as of December 2017. On the contrary, the fewest were in the Karlovy Vary Region (9). Much more interesting is the calculation per million inhabitants, where the Pilsen Region achieves by far the highest values.

82 FRONÿK, D. – JÁKL, P. – STAREC, M., *Beer & Sugar,* c. d., p. 7.
83 JÁKL, Milan – STAREC, Milan, Jákl, *Breweries After: Conversion and Reconstruction,* Prague 2011, p. 24.

Chart No. 7: Distribution of microbreweries by fermentation method (%)

34% bottom

63% both

3% upper

Source: *Own calculation*

region with 63.7 microbreweries per million inhabitants. Prague is surprisingly at the bottom (third from the bottom) with 27.8 microbreweries per million inhabitants. The Czech Republic had an average of 36.4 microbreweries per million inhabitants in 2017.

The clear advantage of the Pilsen region is historically and geographically conditioned; it borders Bavaria, where the density of all possible types of breweries is truly significant.

The shift in technology, or rather the increase in diversity, is very interesting. Previously, almost exclusively bottom-fermented beers were produced, but today the production of top-fermented beers is expanding throughout the Czech Republic. In 2017, 63% of microbreweries produce both bottom-fermented and top-fermented beers, 34% only bottom-fermented and only 3% specialized in top fermentation, as shown in Chart 7. However, the category of microbreweries specializing only in top-fermented beers is constantly expanding. The first of these was the Lucky Bastard brewery in Brno.

There were 248 restaurant microbreweries (characterized by their own beer hall, open at least once a week) in the Czech Republic at the end of 2017, i.e. roughly two-thirds of the total number of microbreweries. It can be assumed that this high share will continue to be maintained, as there is practically no competition among restaurant breweries.

The vast majority of microbreweries also bottle beer, most often into PET bottles. The use of such bottles as packaging for beer has been the subject of endless discussions for many years. A significant percentage is also bottled into glass bottles or various sealable jugs. None of them bottled beer into cans in 2018. At the end of 2017, there were 355 microbreweries bottling beer in the Czech Republic, or 92%.

Lobeÿ Brewery before revitalization
Photo: *Pavel Prouza, 2009*

Lobeÿ Brewery after revitalization
Photo: *Stanislav Švec, 2014*

3.3 FLYING BREWERIES

In the period under review, so-called flying breweries are also beginning to appear. These are a specific type of business entity within microbreweries or craft breweries . These are breweries that have their own trade name and usually their own recipe, but they lack their own technology, so they brew their beer in a contract brewery, usually a microbrewery. Sometimes, however, the contract brewery provides the flying brewery with a recipe and a brewer. Flying breweries benefit from several advantages, in particular the absence of costs for acquiring their own operation and eliminating the problem of finding raw materials, which are usually supplied by the contract brewery. Another advantage lies in lower administrative costs. Flying breweries are only registered like any other business entities, but they are not registered at all by the Customs Administration because they do not pay excise duty. In Czech conditions, it is very difficult to obtain relevant statistics in this area. As of October 2018, the website ceskepivo-ceskezlato.cz listed a total of 82 flying breweries operating in the Czech Republic, and mentioned Two Tales, founded in 2007, as the oldest of them.84

A disadvantage for flying microbreweries may be the fact that some consumers may perceive their production as "bragging about someone else's feathers", even though many such flying breweries refer to their character in their name, an example being the Flying Homeless brewery.

A contract brewery benefits from the use of its own spare capacity. Contract breweries are usually larger microbreweries with an annual output of thousands of hectoliters.
In 2018, Zichovec in Louny was probably the busiest contract microbrewery, with roughly a third of its production destined for flying breweries.

Flying microbreweries are usually designed from the very beginning to be permanently flying, but sometimes they can be a kind of precursor to microbreweries with their own technology. When a flying brewery starts brewing beer using its own technology, we talk about its “landing”. There are a number of microbreweries that have “landed”, the better known of which are the Prague microbreweries Trilobit and Moucha.85

The most famous flying brewery in the world is probably the Danish Mikkeller. This project was created in 2006 in Copenhagen and the name came from the combination of the names of the original owners – Mikkel Borg Bjergsø and Kristian Klarup Keller.

The flip side of the existence of flying breweries are the so-called repackaging beer breweries,86 or repackaged (relabeled) beers. This is how beers are described, which are usually offered by some restaurants as something completely unique, produced especially for them, while it is a completely normal production of a larger mini-

84 Czech beer ÿeské zlato, Overview of Czech breweries, available online: <https://ceskepivo-ceskezlato.cz/seznam-pivovaru/vyber/?rg=cr&so=s33> [25. 10. 2018].
85 The list of Czech flying breweries is given in Appendix No. 2.
86 Pivníci, Beer brewed especially for this business... did you get fooled by chance?, available online: <http://www.pivnici.cz/clanek/pivo-varene-specialne-pro-tento-podnik-nenechali-you-accidentally-got-fucked/> [26. 11. 2018].

Flying Homeless Brewery Logo
Source: *Flying Homeless Brewery, available online: <http:// letajicibezdomovec.cz/ wp-content/ uploads/ 2016/07/ bezdomovec.bmp>* [14. 4. 2019].

Flying brewery logo Two bald men
Source: *Pivovar Dva plešouni, available online: <http:// plesouni.cz/ wp-content/ uploads/ 2016/07/485C.jpg>* [14. 4. 2019].

brewery or a smaller industrial brewery. A special type of these repackaged beers can be various private labels for retail chains, and here too it is often a relabeled regular production of industrial breweries.

3.4 CZECH BREWERY IN 2017

The entire Czech brewing industry is slowly moving towards increasing heterogeneity of production, albeit very cautiously. The Czech market is still very conservative, there is a clear trend of decreasing consumption, especially in the on-trade channel, i.e. in restaurants . As recently as 2010, the ratio to the off-trade channel was 50/50, in 2017 beer consumed outside restaurants already wins with 62%. However, this trend does not apply to microbreweries, in fact, it is the opposite for them. Consumers are becoming more and more demanding and do not just want a product for their money, but also want a story or experience. This fact has enabled an unprecedented increase in the number of microbreweries that can offer the above to consumers.

Table No. 2: Basic indicators of the Czech brewing industry

	2010	2011	2012	2013	2014	2015	2016	2017
Production (million hl) 17.550 18.043 18.692 Consumption				18,690	19,129	19,530 20,475 20,320		
(million hl) 15.570 15.503 15.960 Consumption (per capita)				15,798	15,768	15,703 15,875 16,040		
	143	142	147	144	144	143	143	138
On-trade sales (%)		48	43	41	41	40	39	38
Off-trade sales (%)		52	57	59	59	60	61	62
Imports (thousands of hl)		584	512	498	291	312	326	333
Exports (million hl)		3,125	3,245	3,392	3,652	4.14 4.362		4.6
Number of breweries								431
Number of microbreweries								386

Source: *Brewers of Europe, Czech Association of Breweries and Malteries and own calculations*

Another significant trend is the growth of exports, which compensates for the decline in sales on the domestic market. However, the most significant trend remains the sharp increase in the number of microbreweries. In 2017, there were 40.62 breweries per million inhabitants in the Czech Republic, of which 90% were microbreweries.

4 ESTABLISHING A MINIBREWERY IN CZECH CONDITIONS

Especially in the 1990s, microbreweries were only established by people who had some previous connection to the brewing sector, often former employees of (closed) larger industrial breweries. However, as time goes on, the establishment of new microbreweries is perceived as an investment opportunity and the interest in microbreweries by owners is purely economic.

Establishing a microbrewery is administratively complex in Czech conditions, and the applicant/prospective applicant/candidate must comply with a number of regulations. The Trade Licensing Act (445/1991) lists brewing (and malting) as a so-called craft trade, for which professional competence is required. Achieving competence is specified in Sections 21 and 22 of this Act. If the person concerned does not have professional competence himself, the trade can be operated through another natural person (responsible representative) who meets the requirements for professional competence.87 Many newly established microbreweries make extensive use of this option, which is usually for a fee.

Table No. 3: Accredited MEYS courses in the field of brewing and malting in 2018

Supervisor	Price with VAT	Number of teaching hours
Brewing and Malting Research Institute	70,000 CZK	301
Terra Felix	48,600 CZK	300
Beer Academy	65,000 CZK	300

Source: *Websites of individual institutions/ organizations*

A certain option to supplement the missing education is to complete a retraining course, which must be accredited by the Ministry of Education, Youth and Sports.
In 2018, such a course was offered by three institutions listed in Table 3.

The Brewing and Malting Research Institute runs courses in Prague and Brno, as does the Beer Academy, which collaborates with Mendel University and a number of microbreweries. Terra Felix classes are held at the Frýdlant brewery.

The next step in establishing a microbrewery is to prepare the construction itself, or rather the technology. First, you need to contact the relevant building authority. There are basically three approaches to building a microbrewery:

1. Building a microbrewery on a greenfield site – this is clearly the most difficult an option where a completely new building is being built.

87 Food Chamber of the Czech Republic, SECTORAL GUIDE: Trade: Brewing and malting, available online: <http://www.foodnet.cz/soubor.php?id=15104&kontrola=8bf8b09e-0f42cb43ad22d2c8b41775db> [5. 7. 2018].

2. Installation of technology into an existing food operation – in this case
In this case, this is clearly the simplest option, and the permit is then more of a formal nature.

3. Installation of technology in existing spaces, used but originally
for another purpose - in this case it is necessary to apply to the building authority for a change in the use of the building, or part of it.

The premises for beer production must be registered as a production facility. The building permit must also include a positive opinion from the relevant fire department.

Subsequently, it is necessary to contact the municipal office and discuss the whole matter with it. If the municipal office has no objections, the information about the construction of the (mini)brewery is publicly posted on the official noticeboard and a fifteen-day period begins. If during this period someone expresses their opposition to the construction of the mini-brewery, the entire procedure can be significantly delayed and for the future investor this can mean significant financial losses from non-production.

Furthermore, it is necessary to obtain a permit from the relevant regional sanitary station. In general, it can be stated that it largely depends on the specific official what he wants. It can be expected that he will require various types of certificates for the equipment that will be used for beer production. An analysis of the water used is also necessary. However, microbreweries usually use water from the water supply, which eliminates the need for analysis.

It is also necessary to take into account that a microbrewery is a food operation and therefore must have a separate toilet and sink for personal hygiene of employees. It is likely that the regional hygiene station will require a noise study, for which there are a number of specialized companies.

Since beer production generates a large amount of waste, especially wastewater, it is necessary to contact the environmental department of the relevant municipal office. The detailed conditions again depend on the specific official's interpretation of the existing rules.

An entrepreneur entering the brewing industry must also obtain the consent of a specific river basin, of which there are five in the Czech Republic – the Vltava, Elbe, Ohÿe, Morava and Oder. River basin officials are primarily interested in where the newly established brewery will take its water from and where the waste will flow.

It is necessary to register a new microbrewery operation with the State Agricultural and Food Inspection Authority no later than the day of commencement of production.

Beer is a beverage that is subject to excise duty not only in the Czech Republic but also in most countries around the world, the administration of which is the responsibility of the customs administration in the country. Therefore, it is necessary to contact this institution well in advance before starting production, as every brewery must have a so-called tax warehouse and processing the application for its permit can take a long time. It is recommended to write in the permit application that the brewery will produce as many types of beer as possible, this will avoid changes to the permit in the future. Customs officials usually carry out a physical inspection of the brewery several times a year. The brewery is fundamentally controlled by customs by the office at the place of business registration, not where it is physically located. Everything necessary is stated in Act No. 353/2003, on excise duties, or in the implementing regulations.

Brewers find it inconvenient that excise tax is paid in advance according to the expected quantity of beer produced. The amount of the advance is not determined by the relevant regional customs office, but by the General Directorate of Customs. Before production begins, it is necessary to secure the tax, i.e. deposit the tax advance into the account of the relevant customs office.

4.1 EXCISE TAX ON BEER

Historically, beer (or fermented grain beverages) has always been in the sights of monarchs or governments, because its production used to be profitable. Beer production was burdened by various types of fees or indirect taxes, which can be understood as historical excise taxes. Only in modern times has the existence of an excise tax on beer been justified by the alcohol content of beer, which is completely understandable (but then the absence of an excise tax on wine, which usually contains much more alcohol than beer, is completely incomprehensible in this country).

There are two approaches to taxing beer consumption in the European Union. The more traditional brewing countries derive the tax amount from the so-called percentage of original wort extract , popularly speaking from the strength of the beer. Other countries have their own system linked to the percentage of alcohol, with the calculation of tax collection being the same as in the case of spirits. The first group includes Austria, Belgium, Bulgaria, the Czech Republic, Germany, Greece, Italy, Luxembourg, Malta, the Netherlands, Poland, Portugal and Romania. The second group of countries includes Cyprus, Denmark, Estonia, Spain, Finland , France, Croatia, Hungary, Ireland, Lithuania, Latvia, Sweden, Slovenia, Slovakia and the United Kingdom.[88] The minimum excise tax in the EU on beer is €0.748 per hectolitre of beer and percentage of original wort extract, while in the second method it is €1.87 per hectolitre of beer and percentage of alcohol. Small independent breweries with a maximum annual production of up to 200,000 hl of beer can have a rate reduced by up to 50%, which again depends on the tax policy of each individual member state. Table 4 shows the situation with excise duties on beer in individual EU countries.

A 12-proof beer with 5% alcohol was chosen as the representative product , and as representative brewery sizes, companies with a production of over 200,000 hl (listed as large in the table) per year and 1,000 hl (listed as small in the table) per year were selected. This second low value was chosen purposefully because Cyprus, which distinguishes breweries by size only into operations with a production of up to 1,000 hl per year and over 1,000 hl per year.

88 European Commission, EXCISE DUTY TABLES, available online: <https://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/excise_duties/alcoholic_be-verages/rates/excise_duties-part_i_alcohol_en.pdf> [6. 7. 2018].

Of the above states, only five do not apply tax progression according to the size of the brewery, these states are Sweden, Italy, Lithuania, Poland and Spain. On the other hand, the largest relative tax advantage for small breweries is applied by Denmark, where a small brewery pays only 28% of what a large brewery pays in excise duty. Different states then further apply their national specificities, but this is no longer the subject of this analysis. The highest tax burden is traditionally in the Nordic countries, specifically in Finland.

Table 4: Comparison of excise duties on beer among EU Member States

	EUR/hl		CZK/ half liter		Index
	small	large	small	large	small/large (%)
Denmark	10.35771	37.6385	1.3	4.9	28
Ireland	56.35	112.75	7.3	14.7	50
Luxembourg	4.7592	9.5196	0.6	1.2	50
Croatia	13.3385	26.6775	1.7	3.5	50
Finland	88,875	177.75	11.6	23.1	50
United Kingdom	53,947	107,894	7.0	14.0	50
Estonia	38.8	77.6	5.0	10.1	50
Greece	30	60	3.9	7.8	50
Slovenia	30.25	60.5	3.9	7.9	50
France	18.55	37.1	2.4	4.8	50
Cyprus	15	30	1.9	3.9	50
Hungary	13,004	26,008	1.7	3.4	50
Malta	11.58	23.16	1.5	3.0	50
Latvia Czech	11.25	22.5	1.5	2.9	50
Republic	7,386	14,772	1.0	1.9	50
Bulgaria	4,602	9.2028	0.6	1.2	50
Portugal	10.45	20.89	1.4	2.7	50
Romania	4.7604	8.6316	0.6	1.1	55
Germany	5.2884	9,444	0.7	1.2	56
Austria	14.4	24	1.9	3.1	60
Slovakia	13.26	17,935	1.7	2.3	74
Belgium	20.9136	24.0516	2.7	3.1	87
Netherlands	35.11	37.96	4.6	4.9	92
Sweden	105,148	105,148	13.7	13.7	100
Italy	36.24	36.24	4.7	4.7	100
Lithuania	35.55	35.55	4.6	4.6	100
Poland	21.6732	21.6732	2.8	2.8	100
Spain	49.8	49.8	6.5	6.5	100

Source: *Own calculations based on European Commission data*

Nordic countries generally have high taxation (not only in the area of excise duties), so Denmark's relatively low excise duty rate on beer may seem surprising. In the past, excise duty was even reduced in Denmark.89 The reason was that consumers often imported alcoholic beverages from neighboring Germany, and the Danish treasury lost a lot of money.

4.1.1 BREWERY EXCISE TAX IN THE CZECH REPUBLIC

The Czech Republic has a tax rate divided into six classes based on the size of breweries, which is the highest number in the EU. The same is true for Belgium, Finland, Croatia and Hungary, but these countries have slightly different quantitative boundaries for each class.

The development of excise duty on beer has changed frequently in the Czech context, and the current system has been in force since 1995. Until 1994, there was no diversified excise duty on beer in the Czech context, which is why the Czech Association of Small Independent Breweries was founded in 1993 , which brought together small independent breweries with an annual production of up to 200,000 hl of beer. The organization was headed by the young and ambitious Stanislav Bernard, co-owner of the brewery of the same name.

Through hard lobbying, this association succeeded in pushing through a diversified excise tax modeled after Germany. Without anyone in this organization suspecting it, this laid the economic foundations for the later huge boom in microbreweries. The Czech Association of Small Independent Breweries (ÿSMNP) subsequently gradually reduced its activities, which was also caused by the fact that large breweries were buying up small independent breweries, and the number of members of the association was decreasing. The most striking was the constitution of the brewing group K Brewery Group (since 2012 the company has been renamed Pivovary Lobkowicz Group), when six members (Hlinsko, Klášter Hradištÿ, ÿerná

Hora, Uherský Brod, Jihlava and Vysoký Chlumec) of the seven were originally small independent breweries. Only Protivín usually had an output of over 200 thousand hl, so it was not small. After the death of its chairman Jiÿí Fusek (1945–2014), the association completely ceased its activities. In 2018, the ÿSMNP still formally appeared in the public register.

The excise tax was changed in 1998, when the entire system was slightly adjusted in relation to the grading. The last time the excise tax for breweries was increased as part of the so-called Janot package was on 1 January 2010, when it was assumed that the increase in excise tax would only be temporary, but this did not happen.

The current excise tax rates on beer in the country are shown in Table 5.

The actual calculation of excise tax is very simple; the amount of beer produced is multiplied by the relevant rate and the beer's degree (i.e. the percentage of original wort extract) expressed in degrees Plato.

89 SPIEGEL ONLINE, Denmark Hopes Cheaper Soda Will Boost Economy available online: <http://www.spiegel.de/international/europe/denmark-to-repeal-tax-on-soda-and-beer-to-limit--cross-border-shopping-a-895857.html> [29. 9. 2018].

Logo of the Czech Association of Small Independent Breweries
Source: Czech *Association of Small Independent Breweries, available online: <http:// www.beers.cz/ csmnp/ logom_csmnp.gif>* [14. 4. 2019].

Excise taxes for microbreweries are a frequent target of criticism not only from microbrewery operators themselves, but also from macroeconomists, due to the very low efficiency of their collection. In 2017, the total excise tax levied on beer for all breweries was CZK 4,778,798,878, of which CZK 58,443,576 for microbreweries and CZK 4,720,355,302 for large breweries. In relative terms, this was 1.22% of the total. 98.78%, which indicates a huge difference, considering that there were many times more microbreweries than large breweries. At the end of 2017, there were roughly nine times more microbreweries in the Czech Republic than industrial breweries.

Table 5: Excise tax on beer
Tax rate in CZK/hl for each whole weight percent of original wort extract

Tax rate

Base rate	Reduced rates for small independent breweries				
	Size group by production in hl per year				
	up to and including 10,000	over 10,000 up to and including 50,000	over 50,000 up to and including 100,000	over 100,000 up to 150,000 including	over 150,000 up to 200,000 including
32.00	16.00	19.20	22.40	25.60	28.80

Source: *Excise Tax Act (Section 85)*

With a relatively simplistic calculation, we can conclude that while the average industrial brewery paid an average of approximately CZK 11 million per month to the state budget in 2017, the average microbrewery received approximately CZK 12.5 thousand per month. The collection of excise taxes by the state entails costs, primarily administrative and personnel costs, so this tax can be considered to be quite inefficient. Microbreweries themselves are not burdened so much by their own collection of excise taxes, but rather by costly and lengthy bureaucratic processes. As mentioned above, a specific microbrewery does not fall under the customs office in the place where it is physically located, b customs office in the area where it is located, therefore, control by the customs administration can become even more expensive.

However, the above-mentioned matters are not within the competence of Czech legislation, everything is determined by EC Directives 92/1983 and 92/1984. A change that would benefit both the state and microbreweries would therefore have to come from the European Union institutions. It would certainly be appropriate to exempt at least the smallest microbreweries from administration and payment of excise duty. vovary.

4.2 OPERATIONAL ECONOMICS

The following chapter is undoubtedly not and cannot be completely exhaustive. Each microbrewery is completely unique, is located in a different place, brews different beers, etc. This is therefore a greatly simplified view of the establishment and economics of an average , or rather model microbrewery. After consulting with experts, a microbrewery with a brewing capacity of 10 hl per batch and a total annual production of 1,500 hl of finished beer was selected. The model example provided assumes the production of four types of beers at the same time, which is a common value for microbreweries.

In Czech conditions, there are very few professional documents that would accurately analyze the economics of microbreweries. Some analyses are offered by suppliers of (mini)brewery technologies themselves, however, they often distort information on purpose. They either underestimate costs (expenses) or overestimate revenues (income) in order to attract potential customers for their facilities. They are therefore quite biased and the use of their analyses in practice can be problematic. For the period after 2010 in Czech conditions, it is generally true that a microbrewery with at least average management has an economic payback period of several years. In fact , the only objective professional text published so far regarding the economics of a microbrewery was an article by the author of this monograph in the journal Kvasný prÿmysl.90

The first piece of equipment needed in a microbrewery is a malt crusher. It is desirable that the malt is gently crushed with minimal damage to the barley husks, which is subsequently important for trouble-free draining. A weighbridge is also required so that the exact amount of malt crusher can be measured for each batch.

The capacity of the brewhouse and the entire microbrewery must be carefully considered in advance. It is desirable not to let the company supplying the technology interfere significantly in the decision-making. The latter will often offer or recommend a smaller brewhouse because it is advantageous for them in the long term. As soon as the microbrewery operator finds out that the brewhouse does not suit them in terms of capacity, he will contact the supplier again and the supplier will

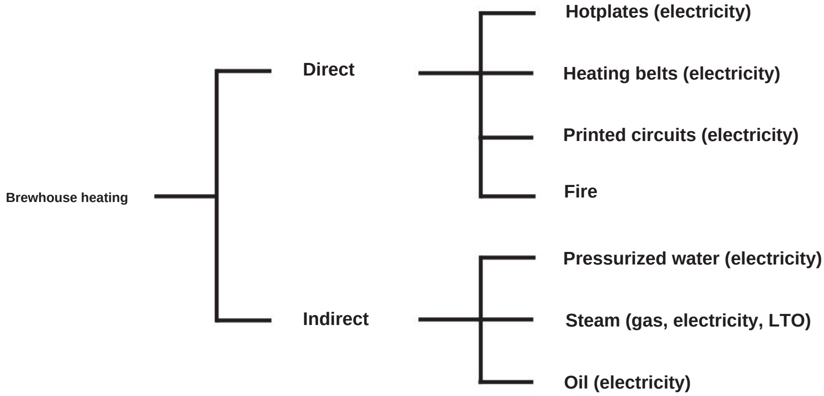
90 MAIER, Tomáš – FABIÁNOVÁ, Aneta, *Economic aspects of the establishment of a restaurant microbrewery,* Yeast Industry, 2011, 57, 9, p. 330.

Brewhouse with a capacity of 10 hl at the Clock Potštejn brewery
Source: *Clock Potštejn Brewery, available online: <https:// ceskepivo-ceskezlato.cz/ fota/ pivovary/ Clock-005.jpg>* [14. 4. 2019].

available for another order, and therefore the expected profit. It is not advisable to save money on the brewery, but at the very beginning it is possible to purchase fewer lager tanks (or fermentation tanks) and then gradually purchase more as the brewery expands. They can be purchased at any time without the need to replace them, any expansion only requires free space in the lager cellar. Before purchasing the technology, it is necessary to conduct a thorough research of the market and existing entities in the supplier sector (microbreweries). Offers from different suppliers can also be combined, but this assumes that the founder of the microbrewery should have a deeper knowledge of the technology, since he himself assumes the role of guarantor for the functioning of the facility as a whole.

The model microbrewery will essentially produce unfiltered beers, which will save considerable investment costs for purchasing a diatomaceous earth filter and also operating costs for purchasing its own diatomaceous earth, as well as the costs of disposing of waste diatomaceous earth.
Filtration of beer in a microbrewery is not necessary for shelf life. Beer is usually consumed within a few days of bottling, so there is no pressure to extend the shelf life.

When building a microbrewery, it is necessary to have suitable premises available; for this model microbrewery, the usable area should be approximately 200 m2, at least 150 m2, including storage areas. Building modifications, or the construction of a completely new building, are not included in this monograph, but they can significantly increase the cost of the entire project. The room heights for the brewhouse should be at least 350 cm and for other spaces at least 300 cm. The microbrewery should be easily accessible from the outside. It is also desirable to take into account the local farmer, who will



Brewhouse heating methods
Source: *Own processing based on consultation with experts*

to drive for threshing, and regular import of malt. If the microbrewery decides to supply beer elsewhere, then it is necessary to logistically resolve the arrival of the truck and its loading with beer.

For a microbrewery of this capacity, a two-vessel stainless steel brewhouse is recommended, while multi-vessel brewhouses are recommended for much larger breweries. The brewhouse should be made of stainless steel, although copper and even glass brewhouses are also available in exceptional **cases91.** The only all-copper brewhouses in the Czech Republic are probably the experimental brewery of Plzeÿský Prazdroj and the Kocour microbrewery in Varnsdorf, whose brewhouse was originally part of the experimental brewery at the Branický brewery.

If a stainless steel cooking pot is part of a restaurant operation, it is often coated with copper for better consumer perception, but there are many examples where this is not the case.

A rather fundamental decision is the choice of the type of heating of the brewhouse. In microbreweries, direct heating of the brewhouse using hot plates, heating belts or so-called printed circuits is more often used.92 It should be noted that the brewing process is a very time-consuming activity - one batch of wort boiled for two mash takes about four hours. The brewhouse must also include a centrifugal pump to be able to pump the mash and subsequently the wort, and it is also desirable to have another pump for draining.

The biggest problem with heating a brewhouse is uneven heating of the work. Direct heating with fire seems to be the most risky from this point of view. Indirect heating via an oil medium has the disadvantage that the microbrewery cannot avoid an oily smell.

91 In the Czech Republic, as of 2018, the only glass brewhouse was in the Prague microbrewery U Supa, the glass one was just one container.

92 The breweries in the Groll and Chÿíÿ microbreweries are completely unique, as they are directly heated by wood. I know.

in the brewhouse, which can be a rather serious problem when placing the brewhouse directly in a restaurant brewery. The best, but also the most expensive solution is indirect heating using hot steam or hot pressurized water. A certain curiosity, perhaps even a curiosity, is the geothermal heating of the brewhouse, which is used in Iceland by the Ölverk microbrewery in the municipality of Hveragerði, which makes good use of it for marketing purposes.93

Then, the hot wort, which is almost 100 °C, must be cooled to the fermentation temperature , which is usually around 7 °C to 8 °C. So-called plate coolers are used and cooling must be as fast as possible so that the product can ferment as soon as possible and unwanted microorganisms do not multiply. The process of cooling the wort to the fermentation temperature should definitely be completed within an hour, but optimally within half an hour. Cooling is carried out using ice water, which is why the brewery must have an ice water tank, and it is recommended that its capacity be 40% larger than the size of the batch. Furthermore, the brewery must have a hot water tank, into which the water from the first stage of wort cooling is collected, and it is again recommended that the volume of this container be 40% larger than the volume of the batch.

The used water can then be used to prepare the next batch, saving energy.

The cooled wort is then aerated in the wort aerator and is passed/pumped into the fermentation tank or an open wort. For microbreweries, which usually have only one fermentation compartment, a closed fermentation tank is more suitable. If the brewery uses both bottom and top fermentation technology, it is not possible to have both next to each other in the wort, as top fermentation yeast would contaminate the bottom fermentation wort with air, as they are significantly more aggressive than bottom fermentation yeast. Sometimes fermentation vessels have twice the volume of the wort being pumped out of the brewhouse, so it is possible to ferment two batches of wort brewed immediately one after the other in the fermentation vessel. This is advantageous for the economy of operation, as this significantly saves energy costs. Also during the main fermentation, the liquid (wort or young beer) must be cooled. It seems more suitable to cool each container (whether an open wort or a fermentation tank) separately using a jacket duplicator, because the temperature in each container can be regulated autonomously according to the relevant technological requirements for different types of beer. Polyurethane foam is most often used as insulation. Another option is to cool the entire room, but then the temperature in all containers is constant without the possibility of individual regulation. A combination of both may also be the solution.

The main fermentation is followed by the final fermentation and the lagering or maturation of (young or green) beer, and it is necessary that the lagering tanks have the same volume as the fermentation vessels. When purchasing a brewery, it is necessary to take into account that beer matures in lager tanks for several weeks to several months, and therefore it is desirable to have a capacity of lager tanks three to four times larger than the volume of fermentation vessels. For lager tanks, space cooling can be used, as is the case in this model case, but then

93 The REYKJAVÍK GRAPEVINE, Geothermal Beer: Hveragerði'sÖlverk Brew Pub Is A Must-Visit, available online: <https://grapevine.is/travel/2018/12/05/geothermal-beer-hveragerdis-ol-verk-brew-pub-is-a-must-visit/> [21. 12. 2018].

It is not possible to regulate the temperature for each tank separately and a serious problem could arise in the parallel production (maturation) of bottom-fermented and top-fermented beers. Bottom-fermented beers mature at a temperature of around 1–2 °C, top-fermented beers at a temperature of around 8 °C.

Once the beer is ready, it is usually pumped into so-called pressure tanks, where it waits until it is filled into kegs or bottles. A bottle tapper and a keg washer and tapper must be available. However, some smaller breweries have their kegs washed elsewhere, which is not included in the model example.

Table No. 6: Approximate prices of components for microbreweries

Component name	Number of required components	Approximate price per piece (CZK)	Approximate total price (CZK)
Brewhouse including accessories	1	2,000,000	2,000,000
Malt crusher (crusher)	1	50,000	50,000
Weight (per malt)	1	14,000	14,000
Wort cooler	1	95,000	95,000
Hot water tank 1,400 l	1	90,000	90,000
Ice water tank 1,400 l	1	90,000	90,000
Wort aeration + air filtration	1	20,000	20,000
CK tank with shell cooling 1,000 l	1	160,000	160,000
CK tank with shell cooling 2,000 l	3	200,000	600,000
Lager tank 1,000 l	3	110,000	360,000
Lager tank 2,000 l	6	160,000	960,000
Pressure tank 1,000 l	2	120,000	240,000
Pressure tank 2,000 l	2	180,000	360,000
Compressor with air conditioning	1	40,000	40,000
Ice water maker, 12 kW	1	350,000	350,000
Sanitation station	1	70,000	70,000
Yeast Regenerator Pump	1	60,000	60,000
	2	15,000	30,000
Manual keg washer and bottler	1	160,000	160,000
Cooling the lager cellar	1	120,000	120,000
Cooking tools	1	10,000	10,000
Laboratory equipment	1	15,000	15,000
Electrical, measurement and control	1	250,000	250,000
Assembly and auxiliary materials	1	50,000	150,000
Transport and assembly	1	250,000	250,000
Project, commissioning, HACCP	1	120,000	120,000
Total			**6,664,000**

Source: *Offers from various companies and our own market research (prices in 2017)*

Table 6 clearly shows the price of components necessary for the construction of a microbrewery with an expected annual production volume of approximately 1,500 hl of beer. The acquisition costs of the technology were calculated at CZK 6,664,000. This is a one-time investment that will be depreciated over five years, because the microbrewery technology falls into the second depreciation group. The straight-line depreciation method was chosen. The depreciation method is clearly shown in Table 7.

As with most projects, when starting a microbrewery, it is necessary to take into account that the actual costs will be even higher; it is always necessary to have a reserve of approximately 10%, but at least 5%.

Table No. 7: Model depreciation of microbrewery technology at a purchase price of CZK 6,664,000 (excluding VAT)

Depreciation year	Residual price	Total depreciation	Annual depreciation
1.	5,930,960	733,040	733,040
2.	4,448,220	2,215,780	1,482,740
3.	2,965,480	3,698,520	1,482,740
4.	1,482,740	5,181,260	1,482,740
5.	0	6,664,000	1,482,740

Source: *Own calculation*

4.2.1 RAW MATERIALS FOR THE PRODUCTION OF BEER

At least these four basic ingredients are required to produce beer:

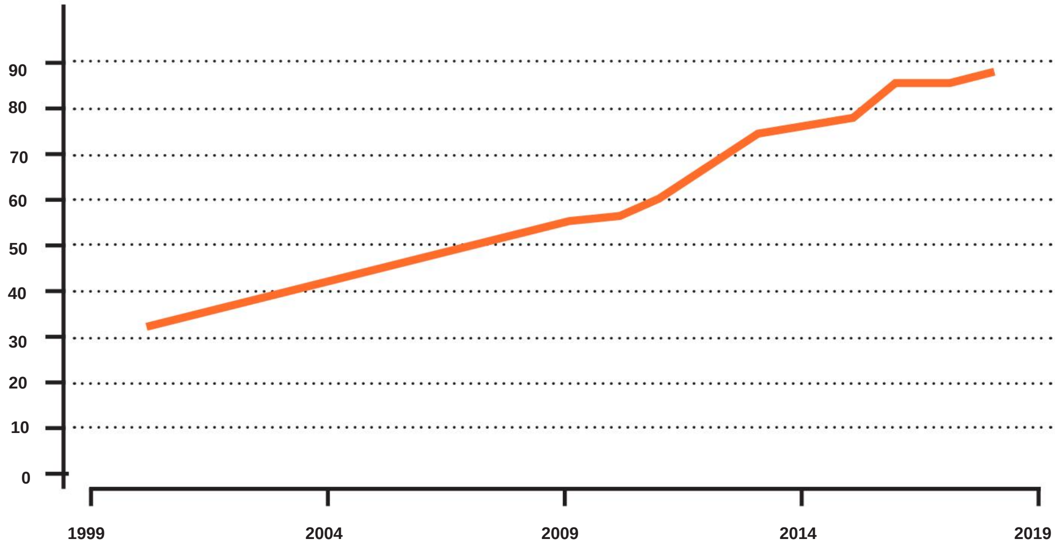
1. water,
2. malt, or malting barley,
3. hops, or hop products,
4. yeast.

4.2.1.1 WATER

Water in a brewery is divided into utility and technological, with less stringent requirements for utility. In general, microbreweries overwhelmingly use tap water. Water makes up 85–95 parts by weight of the beverage.94 It is true that soft water must be used for the production of pale lagers, while for dark and top-fermented beers the water can be slightly harder, which is sometimes recommended or required. Historically, water was not treated in any way; for brewing purposes it was taken

94 BASAÿOVÁ, G. – HLAVÁÿEK, I. – BASAÿ, P. – HLAVÁÿEK, J., *Czech Beer,* cd, p. 42.

Chart No. 8: Development of water prices in Prague in CZK/m3, including VAT



Source: *http:// www.nase-voda.cz*

usually from the nearest sources, which were most often wells or watercourses. In the past, sources were often contaminated with various bacteria, but since the brewing process used in beer production kills all bacteria, there was a significantly lower risk of infection when consuming this beverage than in the case of drinking unboiled water. There are no records of the use of groundwater in brewing from before the Industrial Revolution , so the beginning of its use in this industry can be dated to the 19th century. At the same time, water treatment technologies also began to develop.

Water has a fundamental influence in the design of licensed beer production, because unlike other raw materials, it cannot be transported to the place of licensed production. However, licensed beer production is practically not used in microbreweries, as it would contradict the philosophy of the brewery, which offers a unique product. A kind of licensed beer production can only be spoken of in connection with the so-called flying microbreweries.

Water consumption per unit of final product is much higher in microbreweries than in industrial breweries. In 2018, the Starobrno brewery reported a consumption of 2.8 hl of water per 1 hl of beer produced.95 According to data from Plzeÿský Prazdroj, water consumption in 2016 reached 3.1 hl per 1 hl of beer, which was less than in the previous year.

95 VODARENSTVI.CZ, Director of Starobrn Ondÿej Koucký: We are among the breweries with the most efficient use of water, available online: <http://www.vodarenstvi.cz/2018/06/25/reditel-pivo-varu-starobrno-ondrej-koucky-radime-se-mezi-pivovary-s-nejefektivnejsim-vyuzitim-vody/> [16. 7. 2018].

The world's most famous malt house Wayermann in Bamberg
Photo: *Author's archive, 2013*

year, when the consumption was 4.6 hl per 1 hl of beer.96 A microbrewery should be able to fit in 10 hl of water per 1 hl of beer. In 2018, the price of water (water and sewage) in district towns ranged from CZK 63.66 (Klatovy) per m3 to CZK 114.36 (Tábor) per m3.97 In the model case, the cost calculation will be based on a price of CZK 90 per m3. (including VAT) with a water consumption of 8 hl per 1 hl of beer. Water costs cannot be underestimated, as they are the fastest growing raw material. For illustration, graph no. 8 shows the development of water prices in Prague between 2000–2018.

4.2.1.2 MALT

Barley malt is the basic malt for all types of beer. In some beer styles , barley malt is replaced by malt from other cereals or unmalted cereals, such as in Bavarian-type wheat beer *(Weizen).* There, the ratio of barley and wheat malt is usually half and half. Typical microbreweries in the Czech Republic do not have a malt house, with the exception of the breweries in Dobruška and Bÿeznice, which can be characterized as small, old-fashioned breweries with historic malt houses . In addition, the brewery in Bÿeznice has not been using a malt house for several years. Some other microbreweries are then owned by smaller malt houses.

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96 Pilsner Brewery, NO BEER WITHOUT WATER, available online: <https://www.prazdroj.cz/1601-bez-vody-nen-pivo dne> [16. 7. 2018].
97 SKRBLÍK.CZ, Water Price 2018: Overview of prices for 219 cities in the Czech Republic, available online: <https://www.skrblik.cz/energie/voda/cena-vody/> [16. 7. 2018].

Selected types of malts
Source: *Soufflet Malthouses*

Microbreweries mostly purchase Pilsner malt, which is produced in abundance in the Czech Republic, from domestic malting plants ; only a few of them are engaged in the production of special (non-Pilsner) malts. Microbreweries most often purchase these malts from the Bavarian malting plant Wayermann, which specializes in special malts.

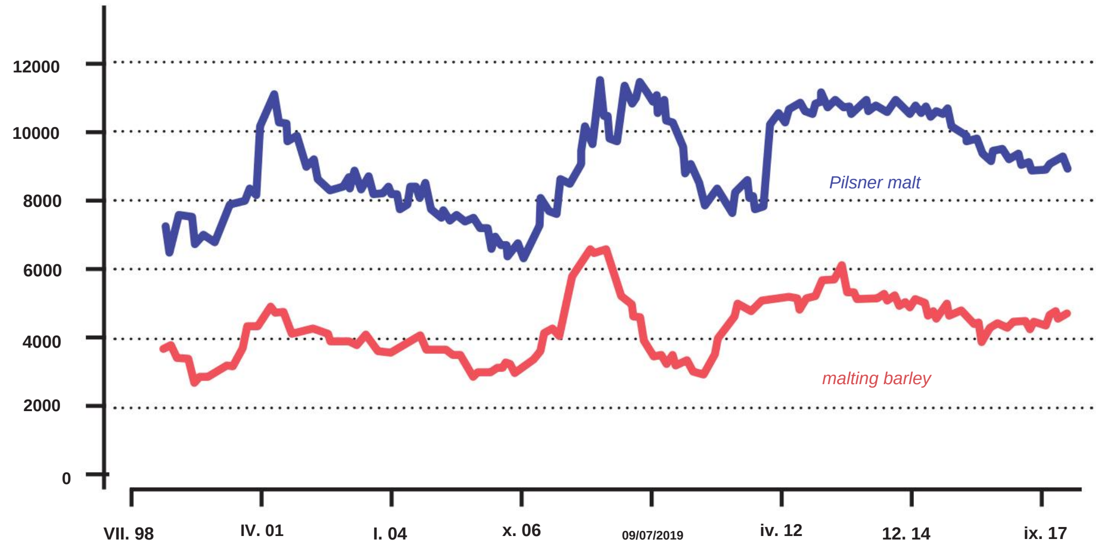
Even when purchasing malt, microbreweries have a competitive disadvantage compared to larger industrial breweries, because due to their minimal market power, they are unable to negotiate larger discounts; they sometimes solve this by jointly purchasing this raw material.

Malting barley prices are monitored by the Czech Statistical Office, but (Pilsen) malt prices are not. Given that the Czech Republic is a traditional exporter of malt – 44.77% of domestic production was exported in 2017[98] – export malt prices can be used for illustration. The price development of both commodities is shown in Chart 9.

The price of Pilsner malt reached a maximum of CZK 11,308/t in April 2008. The lowest was in November 2006, when it fell to CZK 6,360/t, which was economically very unprofitable for malting plants. The lowest price of malting barley was recorded in August 1999 at CZK 2,883/t and the highest in May 2008, when it reached a record level of CZK 6,571/t, which was caused by two consecutive years of very below-average yields per hectare.[99] It is clear from Chart 9 that the price of malt largely copies the price behavior of malting barley.

98 Czech Association of Breweries and Malteries, Annual Statistics 2016, Annual Statistics 2017.
99 Ministry of Agriculture of the Czech Republic, Situation and Outlook Report on Cereals, December 2010, p. 64.

Chart No. 9: Development of prices of malting barley and Pilsner malt (January 1999 to May 2018) in CZK/t



Source: *Czech Statistical Office*

Microbreweries will not reach the stated price due to their weak market power. Their purchase price of Pilsner malt is 10–20% higher than shown in Chart 9. They usually pay CZK 2,000 more for bagged malt than large industrial breweries.

4.2.1.3 HOPS

Research and economic market pressure have led to the fact that only classic head hops are no longer used in beer production. The Beverage Decree (248/2018 Coll.) distinguishes between unmodified hops, modified hops and hop products. ÿepiÿka100 distinguishes three basic types of hop products:

ÿ products prepared by mechanical processing of hop heads,
ÿ products prepared by physical modifications of natural hop heads,
ÿ products prepared by chemical treatments.

Products prepared by mechanical processing of hop heads are primarily ground and granulated hops with or without a standardized content of ÿ-bitter acids. The most widely used are granulated hops (hop pellets) of various types according to the degree of concentration of bitter acids. Their character is closest to

100 ÿEPIÿKA, Jaroslav, *Hop products,* in: FRIC, Václav (ed.), Hop Yearbook 2000, Prague 1999, pp. 173–179.

The latest registered Czech hop varieties: Gaia, Boomerang, Country and Jazz
Photo: *Private archive of Vladimír Nesvadba*

to the original processed hops. They meet the requirements of the German Beer Purity Law (Reinheitsgebot, see below), but do not allow for a significant reduction in nitrate content. Granulated hops are designated by a number according to how many kilograms of granules are produced from 100 kg of natural dried hop heads.[101] The higher this number, the more "natural" the product. They are currently widely used in the production of consumer beers, lagers and special bottom- and top-fermented beers. The granules are usually packaged in an inert atmosphere for greater durability and stability than are common with pressed hop heads.

Products prepared by physical modifications of natural hop heads are unmodified hop extracts, prepared using various solvents.
Their development has stabilized on extracts produced with environmentally friendly solvents, primarily ethanol and carbon dioxide.[102]

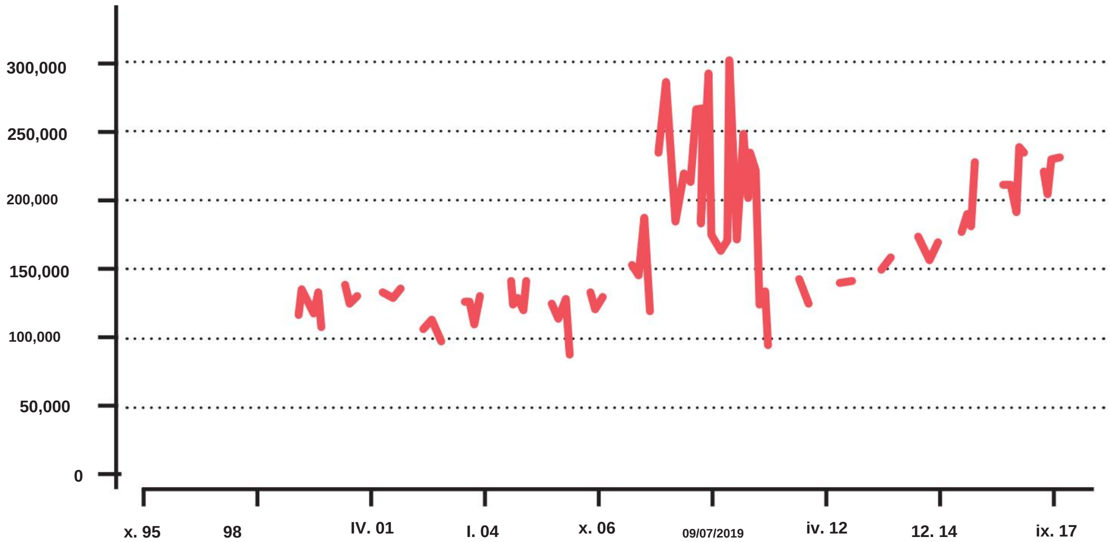
Products prepared by chemical treatments are[103] chemically treated either whole hop heads or – much more often – their individual components, especially ÿ-bitter acids, separated in advance, usually in the form of an extract or cold infusion. A special group is made up of mixed hop products, where one package may contain products of several types, e.g. granulated hops covered in a can with a layer of extract to prevent air from entering. However, their practical occurrence on the market is insignificant, probably due to the complex declaration and control of chemical composition. Standardized products are often products with a constant content of ÿ-bitter acids, while their content can be adjusted by adding other hop components, e.g. tannin content, or other substances, e.g. glucose or sucrose.

101 The most common are pellets of type 100, 90, 45 and 30.

102 They are divided into ethanol extracts, CO2 extracts and hop essential oil preparations.

103 They are divided into isoextracts, isopelletes, reduced (hydrogenated) iso-ÿ-bitter acids and synthetic bitter substances.

Graph No. 10: Development of the farmer's price of hops in the Czech Republic (CZK/t)



Source: *Czech Statistical Office*

The use of hop extracts and hop heads is rarely encountered in microbreweries. Microbreweries most often purchase granulated hops, for all three hopping stages. The use of granules in beer production is still perceived as a traditional brewing method. Granules also have a constant quality, unlike hop heads, they store well and their aging is very slow compared to hop heads.

Graph No. 10 shows the farmer's price of dried hop heads in the years 1999–2017, however, this is usually monitored by the Czech Statistical Office for only a few months a year. In the given period, the highest price was in January 2010 at CZK 301,708/t, and the lowest price was in February 2006 at CZK 92,807/t. However, it is not decisive for microbreweries, because they do not buy at this price at all. The reason is again their minimal bargaining power on the market, they buy hops in very small volumes. However, there is a possibility of quantity discounts if several microbreweries agree on a joint purchase. In general, it can be stated that microbreweries buy granulated hops in the range of CZK 400–1,200/kg. Hops are not a very significant cost item, the only exception being highly hopped ale beers , which usually use expensive foreign hops.

Promotional stations
Photo: *Bernard family brewery*

4.2.1.4 YEAST

Microbreweries do not have their own propagation station, i.e. a place where yeast is propagated, so it would be an unaffordable investment for them, or rather pointless. Promotional stations are beneficial for breweries that produce hundreds of thousands of hectoliters of beer per year. Microbreweries therefore purchase yeast from industrial breweries , or – especially for top-fermented beers – buy dried yeast. *For lagers,* they usually use live yeast. The yeast must be in very good condition, because if there is dead yeast in the beer, it will have a negative impact on its taste. The "guts" from the dead yeast will leak out into the beer, giving it an unpleasant autolyzing aftertaste.

Yeast is a living organism, especially bottom-fermenting yeasts are very sensitive in all aspects, especially to shock changes in temperature. Yeast can be used repeatedly in production if they remain in good condition.

4.2.2 OTHER COSTS

It can be stated that the costs of raw materials (except water) for beer production are not increasing too significantly, Table 8 shows their relative increase between 1999 and 2017, and for water between 2000 and 2018 (the case of Prague). A much greater danger for beer production is the increase in the costs of electricity and personnel.

costs. An Irish study on microbreweries reports that the intensity of labor use in microbreweries is seven times higher than in large breweries.104

Table 8: Development of annual prices of raw materials for beer production

	Malt barley (CZK/t)	Basic index	Pilsner malt (CZK/t)	Real price malt for microbreweries.1	Basic index	Head hops (CZK/t)	Basic index	Water (CZK/m3)	Basic index
1999	3,316	–	7,122	9,122	–	150,789	–	–	–
2000	3,652	110	7,733	9,733	109	132,245	88	32.6	–
2001	4,497	136	9,951	11,951	140	135,250	90	–	–
2002	4,135	125	8,552	10,552	120	107,821	72	–	–
2003	3,873	117	8,321	10,321	117	125,395	83	–	–
2004	3,834	116	7,912	9,912	111	130,357	86	–	–
2005	3,307	100	7,345	9,345	103	127,569	85	–	–
2006	3,252	98	6,686	8,686	94	121,849	81	–	–
2007	4,729	143	8,267	10,267	116	149,524	99	–	–
2008	6,012	181	10,290	12,290	144	217,191	144	–	–
2009	3,848	116	10,715	12,715	150	216,606	144	–	–
2010	3,408	103	8,495	10,495	119	191,225	127	56.5	173
2011	4,821	145	8,200	10,200	115	135,031	90	60.4	185
2012	5,147	155	10,449	12,449	147	143,875	95	66.4	203
2013	5,582	168	10,642	12,642	149	154,403	102	74.4	228
2014	5,164	156	10,582	12,582	149	168,294	112	75.8	232
2015	4,882	147	10,398	12,398	146	196,692	130	77.7	238
2016	4,457	134	9,513	11,513	134	117,902	78	85.2	261
2017	4,452	134	8,992	10,992	126	227,763	151	85.4	262
2018	–	–	–	–	–	–	–	87.4	268

Source: *Czech Statistical Office and http:// www.nase-voda.cz and own calculations*

4.2.3 CALCULATION OF OPERATING COSTS

The operating costs of a model microbrewery will be calculated only for the so-called twelve -proof *lager,* which is still the backbone product of most regular microbreweries and its sale generates the most sales, and therefore profit. In general, it can be stated that the weaker the beer, the lower the costs of its production. The lower the consumption

104 Bord Bia: Irish Food Board, Craft Beer and Microbreweries in Ireland , 2016: A Report for the Independent Craft Brewers of Ireland and Bord Bia, available online: <https://www.bordbia.ie/globalassets/bordbia.ie/industry/marketing-reports/consumer-reports/craft-beer-and-mi-crobreweries-in-ireland-2016.pdf> [10. 10/2018].

input materials (except water) and also energy consumption, because weaker beers have a shorter production cycle, ferment and lager for a shorter time. In general, bottom-fermented beers are more energy-intensive at the same degree, because they have to be cooled more, especially during fermentation and maturation (lager), and the production cycle also lasts longer (even in the order of weeks). Another factor is that top-fermented beers are brewed mainly by infusion, which is significantly less energy-intensive than the decoction usually used for bottom-fermented beers.

On the other hand, top-fermented beers tend to have higher malt costs. This is because they use various special types of malt, which are more expensive. Costs also increase quite often, especially for bitter beers of *the ale type,* which usually use various expensive foreign types of hops, most often from the USA, the United Kingdom or Australi German hops are used minimally in the Czech Republic because their properties are very similar to domestic ones.

Table No. 9: Approximate production costs for the production of a dozen (CZK/half liter) in a microbrewery in 2017 (excluding VAT)

Item	CZK/half liter
Pilsner malt	0.75
Hops	0.58
Yeast	0.1
Water	0.3
Electrical energy	2
Personnel costs	3.9
Total	7.63

Source: *Own calculation*

Table 9 thus shows approximately the costs of producing one half-liter of twelve-degree bottom-fermented beer produced in a microbrewery. This is a purely model and theoretical example and in no way represents a final calculation; the final costs must include excise tax (0.96 CZK for this degree of beer), packaging costs, bottling, depreciation, sanitation, transport, other transaction costs, VAT, etc.

It is necessary to take into account that from the start of operation of the microbrewery, i.e. from the brewing the first batch, the brewery will not receive any major payments for beer for at least three months.

Of the above costs, personnel costs appear to be the riskiest because they grow the fastest, and so their share of total costs is constantly increasing. A major problem for microbreweries is finding a quality brewer, unfortunately this activity is often performed by insufficiently trained employees. It can be stated that due to the double-digit year-on-year increases in the number of microbrewery operations in the period

The brewery of the Podklášterný brewery in Tÿebíÿ
Source: *Podklášterní pivovar Tÿebíÿ, available online: <http:// www.pivovar-trebic.cz/ userfiles/ photo/ normal/ podklasterni_pivovar_trebic_spilka.jpg>* [14. 4. 2019].

2009–2018 The shortage of brewers remains the most pressing problem. There is almost a battle going on among microbreweries for the best quality brewers.

4.2.4 EVALUATION OF THE ECONOMY

Operating costs are far from total costs. Fixed costs are not calculated here, which mainly means depreciation. To make the situation as realistic as possible, let us assume in the following evaluation a gradual increase in production, in the first year the production is expected to be 500 hl, in the second 1,000 hl and now in the third and each subsequent year the maximum production will be calculated at 1,500 hl. If the entire investment is paid from own resources, the final calculation will not include financial costs, i.e. the costs of repaying any loan . Even though the construction of the microbrewery envisaged the production of up to four types of beer in parallel, due to the purposeful simplification, the final calculation will only consider the production of one product – light 12. Another reason is the fact that light 12 will be the backbone product of the entire operation. Economically , the existence of a possible restaurant operation that could be directly connected to the microbrewery will not be taken into account at all , as this would make the entire calculation incredibly unclear.

For the sake of simplicity, two brewers are also calculated from the very beginning, although they will only be needed when the production capacity is fully utilized. Monthly personnel costs were calculated at CZK 97,500. It can be expected that in reality personnel costs will be slightly lower for the first two years.

Table No. 10: Model final cost calculation of beer production in a microbrewery (CZK; excluding VAT)

Item/year	1	2	3	4	5	6
Exhibitions (hl)	500	1,000	1,500	1,500	1,500	1,500
Depreciation	733 040	1 482 740	1 482 740	1 482 740	1 482740	0
Production costs per pint	7.63	7.63	7.63	7.63	7.63	7.63
Total production costs	763,000	1,526,000	2,289,000	2,289,000	2,289,000	2,289,000
Excise tax	96,000	192,000	288,000	288,000	288,000	288,000
Sanitation	10,000	20,000	30,000	30,000	30,000	30,000
Directing and others	50,000	100,000	150,000	150,000	150,000	150,000
Total excluding depreciation	919,000	1,838,000	2,757,000	2,757,000	2,757,000	2,757,000
Total with depreciation	1,652,040	3,320,740	4,239,740	4,239,740	4,239,740	2,757,000
Cost of 0.5 l	16.52	16.60	14.13	14.13	14.13	9.19

Source: *Own calculation*

Other costs are overhead and other costs. Overhead means various ancillary costs and fees such as office supplies, insurance, legal services, various certificates, measurements, inspections, audits, service, etc. For this item, costs of CZK 0.50 per half liter are assumed. In the case of sanitation, costs of CZK 0.10 per half liter are calculated. The resulting calculation does not include packaging costs, because this item is often highly variable in microbreweries. The price for a new KEG barrel ranges between CZK 2,000–3,000 excluding VAT and the price for a PET bottle with a cap without a label ranges around CZK 3.50 excluding VAT.

In simple terms, it can be concluded that the cost of a microbrewery designed in this way is roughly double that of a large industrial brewery. The microbrewery operator must accept this fact and act on it, therefore he must never try to compete on price. The only possible business strategy for a microbrewery is to differentiate itself from the competition and constantly emphasize the rarity of the product.

If the management of a microbrewery sets its business and pricing policy well and if such a business entity is at least moderately managed, its economic viability should be ensured.

5 MINIBREWERIES AND CRAFT BREWERS IN THE WORLD

The emergence of microbreweries and craft breweries is a reaction of consumers and brewers from developed countries to the increasing globalization pressures in the brewing industry. The first globalization tendencies can be noted during the industrial revolution, in many countries this was helped by liberalization, however, the full force of globalization pressure on developed countries did not come until after the Second World War. In developed brewing countries, there were:

1. a significant increase in productivity and production in brewing,
2. market homogenization from a product point of view,
3. a significant increase in market concentration,
4. in connection with this, there was a massive closure of especially smaller breweries,
5. the advent of television advertising, which is used mainly by the largest entities in the field,
6. growth in the purchasing power of the population.

However, each developed market, or rather each country, has its own specifics and the above trends then led to a market reaction sooner or later.

Table 11 shows the prices of draft beer in selected cities around the world. The higher the price of beer, the more likely microbreweries will gain a foothold in the market. In order for microbreweries to enter the market in a given country, the country must be at a higher level of economic development.

There are a number of brewery associations in different parts of the world that try to defend the interests of their members in various ways. In the Czech context, the most important organization is the Czech-Moravian Association of Microbreweries, and in the past it was the Czech Association of Small Independent Breweries, which in 2018 already existed more formally. Similarly, at the EU level, the Association of Small and Independent Breweries in Europe operates, with members from Germany, the United Kingdom, the Czech Republic, Poland, Denmark, Austria, Switzerland and Romania,105 but this organisation is also rather formal and did not carry out any activities in 2018.

In 2018, the situation at the EU level began to change slightly. In September, a meeting of representatives of nine national organizations took place in Brussels, where they agreed to establish an organization called Independent Breweries of Europe. The Czech representative at this meeting was Martin Hájek, vice president of the Czech-Moravian Association of Microbreweries and vice chairman of the board of directors of Pacovské strojírny.

105 Private Brauereien, Association of Small and Independent Breweries in Europe, available online: <http://private-brauereien.de/ebs-en/wettbewerb/veranstalter/sib.php> [4. 11. 2018].

Logo of the Association of Small and Independent Breweries in Europe
Source: *Association of Small and Independent Breweries in Europe, available online: <https:// www.chodovar.cz/ img/ kalendar/ ms-2017-loga-big.jpg>* [14. 4. 2019].

Table 11: Price of draft beer in $ per pint and in CZK per half liter in individual countries of the world (2017)

City, state	$ CZK	City, state	$ CZK
Dubai, United Arab Emirates	12,289	Wellington, New Zealand	5.7 137
Oslo, Norway	10.3 248	Vancouver, Canada	5.5 132
Hong Kong, China	8.9 214	Kuala Lumpur, Malaysia	5.4 130
Singapore, Singapore	8.3 200	Athens, Greece	5.1 123
Zurich, Switzerland	7.7 185	Jakarta, Indonesia	5 120
New York City, United States	7.7 185	Tokyo, Japan	5 120
San Francisco, United States	7.7 185	Moscow, Russia	4.7 113
Paris, France	7.3 176	Vienna, Austria	4.6 111
Stockholm, Sweden	7.3 176	Frankfurt, Germany	4.6 111
London, United Kingdom	7.2 173	Brussels, Belgium	4.5 108
Dublin, Ireland	7.1 171	Mumbai, India	3.9 94
Helsinki, Finland	7.1 171	Berlin, Germany	3.9 94
Auckland, New Zealand	7,169	Sao Paulo, Brazil	3.7 89
Shanghai, China	7,169	Istanbul, Turkey	3.7 89
Melbourne, Australia	6.8 164	New Delhi, India	3.4 82
Copenhagen, Denmark	6.7 161	Bangalore, India	3.2 77
Boston, United States	6.7 161	Rio de Janeiro, Brazil	3.2 77
Milan, Italy	6.5 157	Lisbon, Portugal	2.8 67
Amsterdam, Netherlands	6.1 147	Warsaw, Poland	2.6 63
Sydney, Australia	6.1 147	Cape Town, South Africa	2.6 63
Edinburgh, United Kingdom	6,145	Mexico City, Mexico	2.4 58
Chicago, United States	5.7 137	Johannesburg, South Africa	2.2 53
Madrid, Spain	5.7 137	Prague, Czech Republic	1.6 39
Toronto, Canada	5.7 137	Manila, Philippines	1.5 36

Source: *Business Insider* [106]

The meeting was attended by representatives from the following national professional organisations: 1. Independent Brewers of Ireland, Ireland
2. The Society of Independent Brewers, United Kingdom
3. Syndicat National des Brasseurs Indépendants, France
4. Unionbirrai, Italy
5. Scanian Beverage Producers, Sweden
6. Det Fri Øl, Denmark
7. Craft Brewers Netherlands, Netherlands
8. Czech and Moravian Microbreweries Association, Czech Republic
9. La Asociacion Española de Cerveceras Artesanas Independientes, Spain107

Undoubtedly, the first step of this organization at the EU level will be lobbying in the area of excise duties and their administration, as the bureaucracy associated with this represents one of the most pressing problems for microbreweries throughout the EU.

5.1 UNITED STATES OF AMERICA

The previous subsection listed the phases that the beer market should go through before it matures enough for a large number of microbreweries, and in the USA everything happened almost according to the above analyses, which is why the passage about the situation of microbreweries in selected countries begins with the United States of America.

For the people of the United States of America, the era of craft breweries began in 1965 and the so-called initial pioneering period lasted until 1984. In 1965, 182 national and regional breweries In 1984, there was one craft brewery in the[108] United States , 18 microbreweries, and 76 non-craft and regional breweries.109 In 1965, there were 0.94 breweries per million inhabitants in the USA, but by 1984 this figure had dropped to 0.4. The history of brewing and breweries in the USA is presented in an excellent way in the monograph The History of Beer in America.110

To understand the wave of craft brewery founding in the US, it is necessary to go back in time to the era of alcohol prohibition and the period of great market concentration after World War II.

106 BUSINESS INSIDER, How much it costs to grab a pint of beer around the world, available online: <https://www.businessinsider.com/price-of-beer-around-the-world-2018-5> [27. 10/2018].
107 SIBA, The Independent Brewers of Europe, available online: <http://www.siba.co.uk/2018/10/09/independent-brewers-europe/> [18. 11. 2018].
108 Anchor Brewing Company.
109 HINDY, Steve, *The Craft Beer Revolution: How a Band of Microbrewers Is Transforming the World's Favorite Drink,* New York 2014, p. 5.
110 YENNE, Bill, *The History of Beer in America,* San Francisco 2006.

Demonstrative pouring of barrels of alcohol at the beginning of alcohol prohibition in the USA
Source: *Britannica, available online: <https:// cdn.britannica.com/ 63/116463-050-27BE2871.jpg>*
[April 14, 2019].

Prohibition, the ban on the production and sale of alcohol in the USA, lasted from 1919 to 1933. Even the most ardent opponents of alcohol admit that it caused enormous damage and brought no benefit at all, as corruption and crime increased enormously (the rise of the mafia). The entire market for (illegal) alcohol fell outside the control of the state . From an economic point of view, this meant a huge loss of revenue for the state in the form of zero taxes collected from the production and sale of alcohol . However, after the end of the violent prohibition, many breweries, especially smaller ones, did not resume production, which to some extent affected the diversity of the market. After World War II, the entire US beer market was marked by a huge unification of production and an increase in market concentration.

Large brewing companies such as Schlitz and Anheuser-Busch began to invest huge sums in sales promotion, especially in advertising, and increasingly influenced consumer public opinion in the USA. Beer became a taste-neutral product , which was advantageous from an advertising perspective, since it is economically most advantageous for large breweries to promote one homogeneous product or a few products that appeal to a wide range of consumers . Schlitz almost apologetically stated in its advertisements that its beers had just a touch of hops (in the original “just a touch of

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Table 12: Market shares of the five largest companies in the US beer market (%)

	1950	1960	1970	1980	1990	2000	2005
Slot	6	6	12	9			
Anheuser-Busch	6	10	18	28	42	53.4	49.5
Ballantine	5	–	–	–	–	–	–
Pabst	4	5	8	9		5.7	3.4
Schaefer	3	–	5	–	–	–	–
Falstaff	–	6	–	–	–	–	–
Carling	–	5	–	–	–	–	–
Coors	–	–	6	8	9	12.5	11.1
Miller	–	–	–	21	22	22.6	18.7
Tree	–	–	–	–	10	–	–
Genesee	–	–	–	–	–	0.1	–
D. G. Yuengling–	–	–	–	–	–	0.1	
Total 5 largest 24		32	49	75	83	94.3	82.8

Source: *YENNE, B.,* The History, *cd, p. 154.*

a kiss of hops"), as if the taste of hops had become something negative.111 Consumers were also quite malleable at that time, marketing tools worked effectively on them, and thanks mainly to television advertising, they lived their so-called American dream. The 1950s and 1960s were the golden age of television advertising.112 Smaller breweries began to adapt to this , but they lost the opportunity to differentiate themselves from the competition (mainstream) with a different product and began to be squeezed out of the market by large companies. Smaller breweries were bought up in large numbers by their larger competitors and then usually closed. During the 1970s, the number of brewing companies in the USA fell to less than 50.

But it wasn't just hops that were spared. At that time, breweries also began to use corn to produce beer on a larger scale. The rate of surrogacy was high, in American *lagers* between 35% and 75% of barley malt was replaced with corn or rice.113 The savings on basic raw materials can also be documented in other ways – in 2000, large breweries used 62% less hops and 21% less malt per hectoliter of beer than they did in the previous year. was in 1950.114 However, this was also helped to some extent by the later preference for fewer calories in beer.

The result was a largely neutral-tasting beer category called American light *lager.* The Beer Judge Certification Program states that such a beer would

111 Ibid., p. 114.
112 Ibid., p. 116.
113 GOLDAMMER, Ted, *The Brewer's Handbook: The Complete Book to Brewing Beer,* Clifton 2008, p. 177.
114 Ibid., p. 58.

A view of the Schlitz brewery, which was once the number one beer in the US market
Source: *Author's archive*

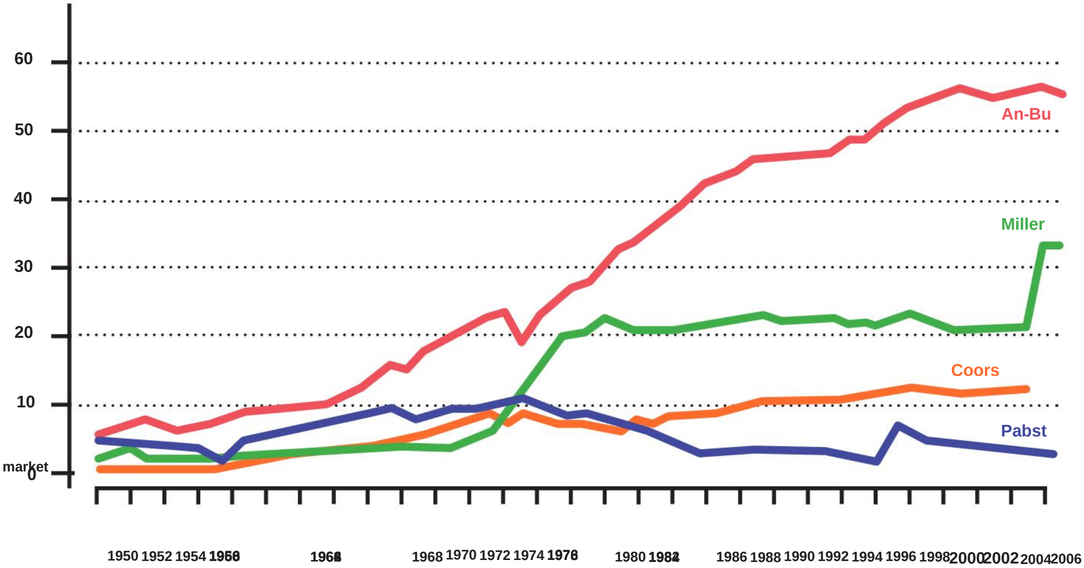
should have 8–12 IBU (bitterness units). For comparison: a Czech *lager* should have 30–45 IBU.115

Table 12 documents the concentration in the beer market after World War II . The measurement is made using a simple concentration coefficient CC5, i.e. the sum of the market shares of the five largest companies. The beer market in the USA is dominated by Anheuser-Busch. Shortly after World War II, it took over the market leadership and its market share only grew. It is clear that with the unification of the product, market concentration rose to dizzying heights. Even in the early days of craft breweries, market concentration continued to grow significantly, and its decline only occurred between 2000 and 2005, when the opposite trend, i.e. the boom of microbreweries or craft breweries, began to take full effect. Consumers increasingly began to turn their backs on the market of traditional unified beer, i.e. light American *lager,* and began to switch to beer produced by craft breweries to a relatively large extent . It is undoubtedly interesting that the brewing company D. G. Yuengling, which was the fifth largest brewing company in the USA in 2005, is classified as an independent and craft brewer. In 2017, craft brewers already had a 12.7% share of the US market.116

115 Beer Judge Certification Program, 2015 STYLE GUIDELINES, available online: <https:// www.bjcp.org/docs/2015_Guidelines_Beer.pdf> [26. 10/2018].

116 BREWERS ASSOCIATON, National Beer Sales &Production Data, available online: <https:// www.brewersassociation.org/statistics/national-beer-sales-production-data/> [11. 7. 2018].

Chart No. 11: Growth of market shares of individual companies in the US beer market



Source: *CABRAS, Ignazio – BAMFORTH, Charles,* From reviving tradition to fostering innovation and changing marketing: the evolution of micro-brewing in the UK and US, 1980–2012, *Business History, 2015, 58, 5, p. 630.*

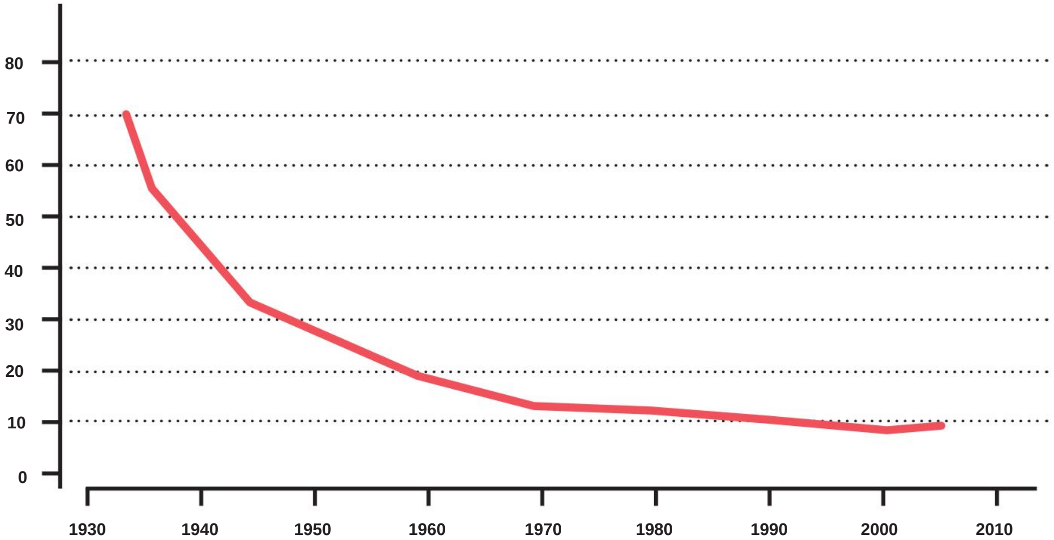
One more fact is worth noting in the case of the US beer market, namely the relative decline in sales of draft beer. A similar, although much milder , decline is also characteristic of the Czech Republic. Graph No. 12 demonstrates how draft beer, with its unshakable position of 75% of sales in draft form, has become an economically almost insignificant segment. In 1934, immediately after the repeal of Prohibition, its share of consumption was 75%, in 2000 it was only 9.3%. From these values, it can be concluded that beer no longer fulfills the social function it did before World War II, when people gathered in large numbers to drink this beverage and consumed it at home to a much lesser extent. However , the fact remains that in the US, drinking beer from a can or bottle is quite common in restaurants, which is rather exceptional in the Czech Republic.

Then in 1965 something happened that would forever change the face of the US brewing market. Fritz Maytag (* 1937) bought the failing Anchor Brewing Company in San Francisco,117 which had been founded in 1896. To be precise, he bought 51% of the brewery for $5,000.118 In 1969 he bought the remaining share.
Maytag reevaluated the company's manufacturing strategy in favor of traditional manufacturing methods that were characteristic of Europe at the time. During this period,

117 HINDY, S., *The Craft Beer,* cd, p. 6.
118 ANCHOR BREWING, OUR HISTORY, available online: <https://www.anchorbrewing.com/brewery/our_history> [10. 7. 2018].

Machine Translated by Google

Chart 12: Relative decline in draft beer consumption in the USA (%)



Source: *YENNE, B.,* The History of Beer, *cd, p. 154.*

All domestic producers such as Anheuser-Busch, Schlitz, Pabst and Falstaff (the four largest producers in 1965) produced the above-mentioned light pale beers, often substituted with corn or rice.119 Anchor Brewing Company was in great financial trouble at the time, on the verge of bankruptcy. Maytag later admitted in an interview that when he bought the brewery, its equipment was very outdated and the quality of the beer was inconsistent.120 In 1969, he continued the tradition of brewing steam beer, which had reportedly been brewed in the western United States since the 19th century. It probably got its name because the wort was cooled on the roofs of houses and steam rose from the roofs.121 It is *a lager,* but it ferments at higher temperatures typical of ale beers , so the sensory properties of the resulting product are a cross between these two categories.122 Maytag registered a trademark for Anchor Steam Beer. Today, this beer, along with others, is classified in the *California* ale category.

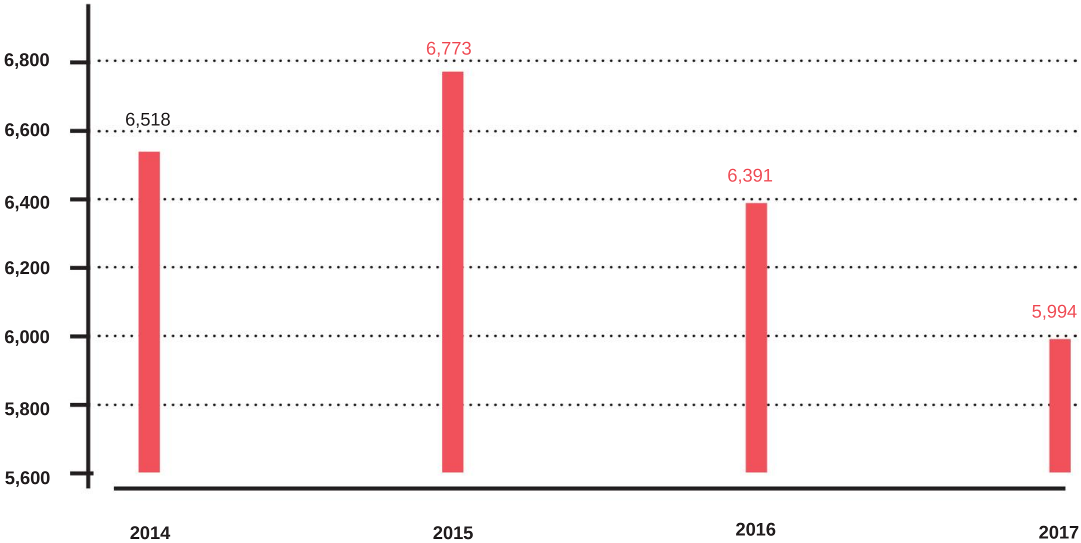
119 ELZINGA, Kenneth, G. – TREMBLAY, Carol Horton – TREMBLAY, Victor, J., *Craft Beer in the USA: Strategic Connections to Macro- and European Brewers,* in GARAVAGLIA, Christian – SWIN-NEN, Johan (edd.), Economic Perspectives on Craft Beer, Cham 2018, p. 56.

120 Funding Universe, Anchor Brewing Company History, available online: <http://www.funding-universe.com/company-histories/anchor-brewing-company-history/> [10. 7. 2018].

121 ANCHOR BREWING, Anchor Steam® Beer, available online: <https://www.anchorbrewing.com/beer/anchor_steam> [10. 7. 2018].

122 World Beer Cup, 2016 WORLD BEER CUP **SM:** COMPETITION STYLE LIST, DESCRIPTIONS AND SPECIFICATIONS, available online: <http://www.worldbeercup.org/wp-content/uploads/2015/10/16_WBC_Style_Guidelines_Final.pdf> [10. 7. 2018].

Chart No. 13: Boston Beer Company's output in 2014–2017 in million hl



Source: *Statista*

nia common beer. By 1975, the brewery had also started producing Anchor Porter, Liberty Ale, Old Foghorn Barleywine Ale and the first annual Christmas Ale.123 When Maytag bought the brewery in 1965, it had an annual production of 1,600 hl of beer, so according to the generally accepted classification it fell into the category of microbreweries. Its capacity was 80,000 hl. It took a decade to increase production to 12,000 hl and thus bring the brewery into the black economically.124 In 2017, the brewery was bought by the Japanese (global) company Sapporo, however, the year before, the Anchor Brewing Company's output had already amounted to 214,633 **hl.125**

Another truly pioneering venture was the opening of the New Albion Brewing Company in Sonoma, California. The idea was conceived by Jack McAuliffe (* 1945), who had previously served in the US Navy in Scotland and brewed his own beer there. It should be noted that homebrewing was prohibited in the US until 1979 , a remnant of the infamous Prohibition. Jack McAuliffe and his partners, Suzy Denison and Jane Zimmermann, raised $8,000 in initial capital. McAuliffe himself contributed $5,000, and both women contributed $1,500 each.126 It was a typical garage brewery at the time. He purchased his malt from Anchor Brewing

123 ANCHOR BREWING, Anchor Steam® Beer, available online, cd

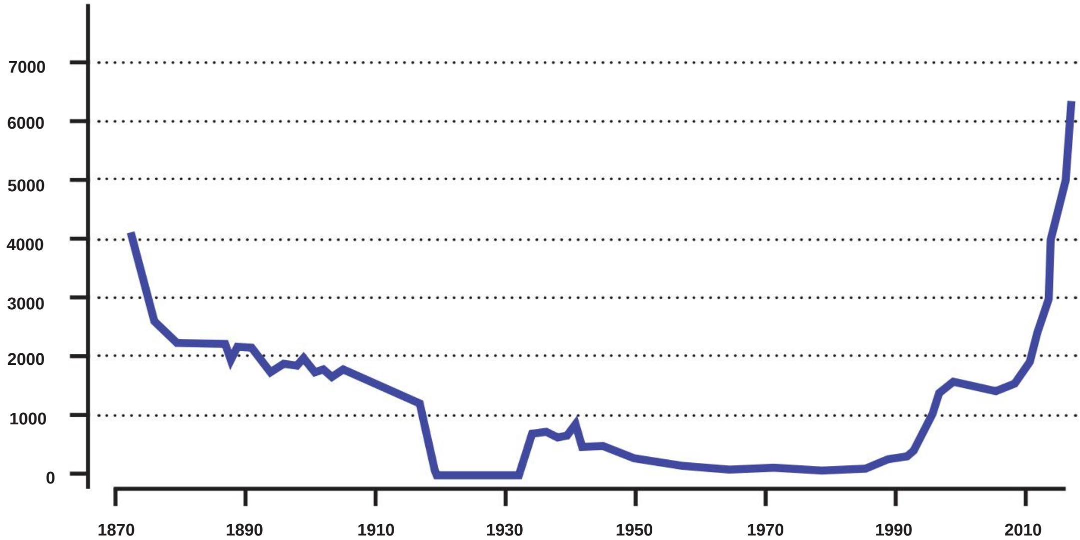
124 ELZINGA, K., G. – TREMBLAY, C., H. – TREMBLAY, V., J., *Craft Beer,* cd, p. 56.

125 Brewbound: Craft Beer News, Events & Jobs, Sapporo Holdings to Purchase Anchor Brewing for $85 Million, available online: <https://www.brewbound.com/news/sapporo-holdings-purcha-se-anchor-brewing-85-million> [1. 9. 2019].

126 HINDY, S., *The Craft Beer Revolution,* cd, p. 13.

Machine Translated by Google

Chart No. 14: Development of the number of breweries in the USA since 1873



Source: *Brewers Association*

Company and used the Cascade and Cluster hop varieties. One batch contained a total of 2 hl,127 so it was truly a "picobrewery", or rather an advanced homebrewing , but it had a guaranteed market. Production was very labor-intensive, with bottling and labeling done by hand.

The brewery had to choose a different business strategy to differentiate itself from the competition, brewing *porter, ale and stout.* Unfortunately, lack of capital and minimal production volume led to the brewery having to close in 1982. In 2009, its tradition was revived by former brewer Don Barkley. Other craft breweries founded during this time include Sierra Nevada, Redhook, Boulder Brewing, Hales Ales and, last but not least, Boston Beer Company. This is the second largest craft brewery in the USA, if it can still be considered craft , as its annual production has been around six million hectoliters in recent years . It is therefore clear that the term "craft brewery" is perceived somewhat differently in the USA than in the Czech Republic. The Boston Beer Company produces about 70% of what

The number one company on the Czech market is Plzeÿský Prazdroj.

Microbreweries or craft breweries are in no way miniature versions of large industrial breweries, the technology in such a brewery is usually somewhat different, and in addition there is usually a significantly higher share of human labor and costs in general. Therefore, hand in hand with the emergence of the first microbreweries and craft breweries

127 Craft Beer and Brewing, New Albion Brewing Company, available online: <https://beerandbre-wing.com/dictionary/cz1kGLyNNx/new-albion-brewing-company/> [10. 7. 2018].

They organize various professional or scientific conferences focused on these specifics. Hindy states that the sixth annual microbrewery conference in the USA was held in 1984.128 Logically, the first conference must have been in 1979. Unfortunately, no further information is available about this event. However, the legalization of home brewing in the same country undoubtedly contributed greatly to the organization of the conference.
year.

After the repeal of Prohibition in 1933, the so-called three-tier distribution system was applied to the entire alcoholic beverage sector. The business units were very strictly divided into alcohol producers (or importers), distributors and retail , which also included public catering establishments, which significantly conserved the entire system and created barriers to entry into the sector. This system was very advantageous for existing large producers, but it strongly prevented new entities from entering the market. Since 1982, these restrictions have gradually begun to be relaxed for beer and restaurant microbreweries (brewpubs) have been legalized,129 in which beer is often sold directly from the producer to the end consumer. However, it should be noted that each federal state within the USA continues to have its own way of dealing with the distribution of alcohol or beer and homebrewing, so there are liberal and, conversely, conservative states. Similarly, states have individually resolved excise taxes on beer. The statista.com server reports that in 2018 the highest excise tax on beer was in the state of Tennessee at $1.29 per gallon, or 3.88 CZK130

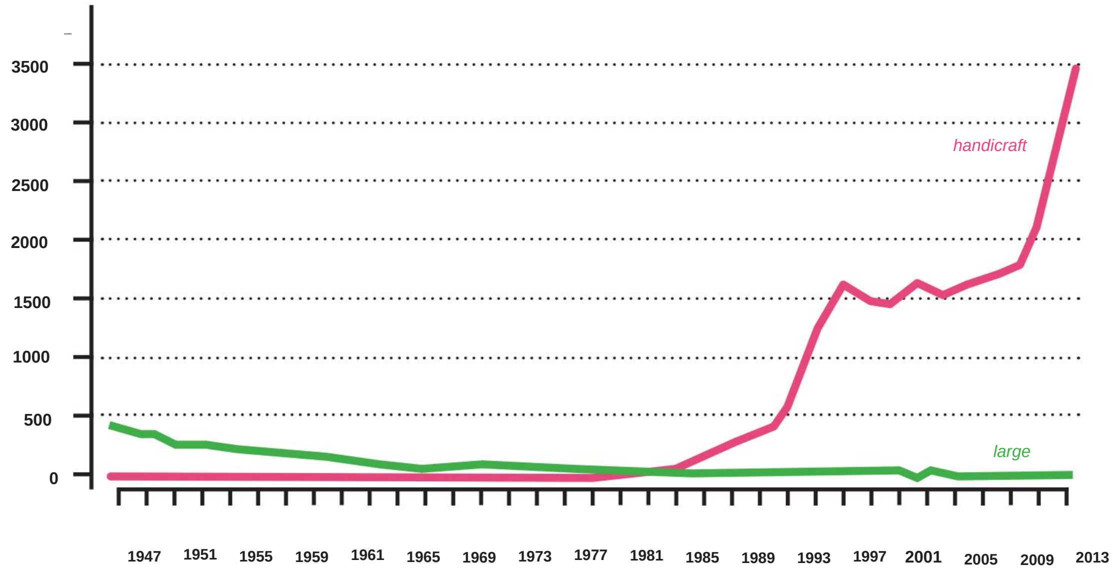
per half liter, the lowest in the state of Wyoming at 0.06 CZK per half liter.131 For comparison: in the Czech Republic this value is 1.92 CZK.

Leaving aside the Prohibition period, the number of breweries in the US, after a steady decline, reached its low point in 1978, when there were only 89 breweries operating in the entire US (see Chart 14). According to Alan Kornhauser, there were 45 brewing companies in the US in 1975.132

Graph No. 14 includes all breweries, i.e. large industrial, craft, restaurant microbreweries and possibly others. In the graph, it is impossible not to notice the period of alcohol prohibition between 1919–1933 and the subsequent great wave of concentration after World War II. The number of large breweries (brewing companies) decreased between 1947 and 2014 from 421 to 10,133. This development is documented in Graph No. 15.

128 HINDY, S., *The Craft Beer Revolution,* cd, p. 15.
129 ELZINGA, KG – TREMBLAY, CH – TREMBLAY, VJ, *Craft Beer,* cd, p. 57.
130 Converted at the CNB exchange rate of 27 October 2018 of 22.797 CZK/EUR.
131 Statista – The portal for statistics, Beer excise tax rates in the United States as of January 2018, by state (in USdollars per gallon), available online: <https://www.statista.com/sta-tistics/324598/us-beer-excise-tax-rates-by-state/> [27. 10/2018].
132 KORNHAUSER, Alan, *Foreword,* in: PATTERSON, Mark - HOALST-PULLEN, Nancy (edd.), The Geography of Beer: Regions, Environment, and Societies, New York 2014, p. VI.
133 GARAVAGLIA, Christian – SWINNEN, Johan, *Economics of the Craft Beer Revolution: A Comparative International Perspective,* in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, Cham 2018, p. 9.

Chart No. 15: Development of the number of companies in the brewing industry in the USA



Source: *ELZINGA, K., G. – TREMBLAY, C., H. – TREMBLAY, V., J.,* Craft Beer in the USA, *c. d., s. 58.*

In the US, craft breweries can be divided into three categories:

1. regional craft breweries,
2. microbreweries,
3. restaurant microbreweries.

Their initially gradual and subsequently very steep boom dates back to 1965. In 1965 there was only one craft brewery, in 2017 there were already 6,266.134 These breweries were characterized by higher costs, and therefore a higher price of the finished product , and yet they managed to establish themselves with their products. In 1985, the number of craft breweries exceeded the number of large brewing companies for the first time and reached its maximum in 2000. The craft brewery sector then ran out of steam for the first time, which was also caused by the often low quality of beer in many craft breweries that were not at a sufficiently professional level. A renewed increase was typical for the craft brewery segment from 2007, when almost a thousand new breweries were established year-on-year.

The craft brewery segment in the US emerged as a new, distinct and very self-confident part of the American brewing industry sometime between 1984 and 1994. Here, more than anywhere else, the adage applies that for every reaction (extreme growth in market concentration) there is a counter-reaction, with the emergence of a number of smaller producers. This app

134 ELZINGA, K., G. – TREMBLAY, C., H. – TREMBLAY, V., J., *Craft Beer,* cd, p. 58.

especially innovations in the brewing sector, with the American beer market today quite rightly showing the greatest heterogeneity of beer styles in the world, some of which are quite bizarre.

The American beer market differs from the Czech one in many ways, the biggest being probably the size of the market. In the USA, it is not a problem to buy beer brewed in a craft brewery on the West Coast on the East Coast. The Czech market is quite closed , as a rule, you can buy craft beer from the other side of the country in specialized stores , but it is usually not possible to buy it from another EU member state.

It is in this aspect that craft breweries in the US have greater growth potential compared to craft breweries in the EU. This is mainly due to the absence of a language barrier, a perfect highway network and, last but not least, the free movement of goods and capital in the US really works, which is not entirely the case in the EU.

The trend in the craft brewery segment in the US in recent years has been the acquisition of successful craft breweries by large industrial breweries. This trend emerged in the US sometime after 2000, when large industrial (traditional) breweries had to start respecting the craft brewery segment for economic reasons.

The practice is that a large industrial brewery buys a successful craft brewery, but usually does not interfere significantly in its management and economy. The industrial brewery also tries to avoid any media coverage of this takeover in terms of potential public relations problems. However, this trend can occur in the case of large brewing markets, such as the US market, in the Czech Republic, due to the very limited growth of the microbrewery segment, or rather craft breweries, something like this is largely excluded in the future.

In 2016, there were 16.81 breweries and 16.61 craft breweries per million U.S. residents.

5.2 UNITED KINGDOM

In the United Kingdom, as in other parts of the world, there was a great increase in concentration in a number of sectors during the 20th century, and brewing was no exception. However, British brewing is somewhat specific, and in particular it is strongly conservative . For example, hops did not become established as one of the main ingredients in beer in the British Isles until the 19th century. There are few countries where the second half of the 19th century did not see such a significant boom in bottom-fermented beers as in the United Kingdom. Ale is therefore most often associated with the United Kingdom . Verhoef [135] states that it was the famous “island mentality” that fortunately managed to protect English *ale* from European (continental) influences. Britain today offers a wide range of *ale-type beers,* ranging from rather bland ales to a number of

135 VERHOEF, B., *Great Encyclopedia of Beer,* cd, p. 60.

Traditional English tap – pressure tap
Photo: *Author's archive, 2018*

excellent beers with an excellent taste and pleasant aroma, which are unmatched in intensity and clarity by almost no *lager.136*

In addition to various types of beers , the United Kingdom also gave the world *porter and stout beers.* The term *porter* was first used in 1721 to describe a dark brown beer made with the addition of roasted malts.137 The name is said to be derived from London hotel porters who consumed this style extensively. This beer style probably reached its peak in the 19th century, then began to decline in popularity, almost becoming extinct. Its renaissance is associated with the second half of the 20th century, specifically with the years 1978–1979, when two British breweries, Penrhos and Keighley, tried to revive this beer style.138 Unfortunately , today we can find beers under the term *porter* that have nothing to do *with porter .* A true *porter* should be top-fermented, with the exception of the style called *Baltic porter,* which is sometimes bottom-fermented under the influence of Czech and German technologies.139 At the time of the creation of *Baltic porter ,* Prussia, which is now part of Germany, extended to the present-day Baltic states. The confusing characteristics of this beer style were also reflected in the old Czech beverage decree, which described *porter* as

136 Ibid., p. 60.
137 OLŠOVSKÁ, Jana – ÿEJKA, Pavel – ŠTÿRBA, Pavel – SLABÝ, Martin, *Sensory analysis of beer,* Prague 2017, p. 117.
138 JACKSON, M., *Encyclopedia of Beer,* cd, p. 157.
139 All About Beer Magazine, Baltic Porters, available online: <http://allaboutbeer.com/article/baltic-porters/> [16. 10. 2018].

Table 13: Number of breweries, beer production and consumption in the United Kingdom in the period 1900–1980

Year	Number of breweries	Production (million hl)	Consumption (million hl)	Consumption per capita (l)
1900	6447	41.6	52.2	136.3
1910	4398	41.2	51.5	122.3
1920	2914	41.0	33.1	75.0
1930	1418	28.9	–	–
1940	840	29.5	53.4	60.0
1950	567	40.7	42.1	81.1
1960	358	44.3	45.0	85.9
1970	220	56.2	57.2	102.6
1980	142	68.2	65.5	118.3

Source: *CABRAS, I. – BAMFORTH, C.,* From reviving tradition, *c. d., s. 629.*

was defined as "dark beer made mainly from barley malts with an original wort extract of 18% by weight and higher".140 According to this decree, only the strength and colour of the beer mattered, and it did not indicate the beer style. True (non-Baltic) *porter* is, however, a dark, top-fermented beer, in the production of which a larger amount of roasted malt is also used. This beer must have a dry and roasted taste. It certainly should not have a sweet taste, as is unfortunately often the case.

Stout is even older, the word (meaning massive or full-bodied in English) was first used in connection with beer in 1677 in the Egerton Manuscript, and it referred to a beer that was primarily strong and not dark.141 *Stout* is most famously made famous by the Guinness brewery, and unlike *porter,* it can also have a sweeter taste. A special type *of stout* is *milk stout,* which uses lactose (milk sugar) in its production.
The reason is that lactose is difficult for brewer's yeast to digest, so it remains virtually untouched in the final product.

The British brewing industry also benefited considerably from its extensive colonial dominions, which is said to have given rise to the *India pale ale (IPA)* beer style and which also provided huge export opportunities. Together with scientific and technological developments, traditional small breweries grew into large companies during the 20th century and smaller companies were pushed to the margins of the market, while overall production increased. Table 13 shows some key figures for beer production in the United Kingdom.

In Table 13, it is impossible not to notice the enormous drop in beer consumption per capita between 1910 and 1920. The drop of 47.3 liters is absolutely unprecedented, relatively speaking it amounts to a full 39%. The primary cause is undoubtedly the First World War, the second and certainly more important is the adoption of the law to protect

140 Laws for People, Decree No. 335/1997 Coll., available online: <https://www.zakonyprolidi.cz/cs/1997-335> [16. 10. 2018].
141 OLŠOVSKÁ, J. – ÿEJKA, P. – ŠTÿRBA, P. – SLABÝ, M., *Sensory analysis of beer,* cd, p. 117.

The British brewing company Bass once owned the Prague Breweries (Pivovary Staropramen)
Source: *Wikimedia Commons, available online: <https:// upload. wikimedia.org/ wikipedia/ commons/ thumb/ 9/9b/ Bass_logo. svg/ 180px-Bass_logo.svg.png>* [14. 4. 2019].

The Defence of the Realm Act (DORA). The United Kingdom entered the war on 4 August 1914 and this Act was passed on 8 August, and was therefore a consequence of the United Kingdom's entry into the war, giving the government significant powers and introducing a certain degree of censorship. In 1915, sections were added to it that essentially concerned the consumption of alcohol, including beer. They were based on concerns that the purchasing power of the population had increased so much that it could lead to excessive drunkenness. The intention was to drastically reduce the consumption of all alcohol; one of the regulations, for example, prohibited the purchase of alcohol for the direct consumption of another person. The sale of alcohol on means of transport was not permitted, which mainly concerned train and ship transport. Opening hours in pubs were heavily regulated, they could be open from 12:00 to 14:30 and from 18:30 to 21:30, previously pubs could be open from 5:00 to 0:30.142 The government also partially addressed prohibition by buying up local breweries, and alcohol advertising was also banned. Excise duty was also sharply increased, a bottle of whisky cost one pound in 1918, which was five times more than before the war. It is interesting that the afternoon break remained in British law until 1988, when the so-called Licensing Act came into effect.143

The wartime prohibition restrictions are now viewed with great controversy. There was a reduction in the recorded consumption of alcohol, but as elsewhere in the world, similar restrictions led to a huge increase in production and consumption from illegal activities, which also cost the state treasury. Another intention of these restrictions was to prevent the wives of soldiers fighting at the front from resorting to individual drinking. It is also interesting that the DORA law was enforced much more strictly in Ireland than in Great Britain itself.144

142 Spartacus Educational, https://spartacus-educational.com/FWWdora.htm, available online: <http://spartacus-educational.com/FWWdora.htm> [7. 8. 2018].
143 UK legislation, Licensing Act 1988 (repealed) 1988 CHAPTER 17, available online: <http://www.legislation.gov.uk/ukpga/1988/17> [7. 8. 2018].
144 TOWNSHED, Charles, *Force, Law and the Irish Revolution,* in: PASETA, Senia (edd.), Uncertain Futures. Essays about the Irish Past for Roy Foster, Oxford 2016, p. 162.

The new situation forced large breweries to diversify their product portfolio into alternative products, such as light drinks. Breweries also had to deal with acute shortages of raw materials and their rising prices.145

Another blow causing the closure of breweries, and thus increasing market concentration, was the period of the world economic crisis at the beginning of the 1930s, when the economic situation of companies deteriorated significantly and the purchasing power of the population decreased. Between 1930 and 1940, the number of breweries fell by 41%; unfortunately, data for natural production and consumption for 1930 are not available. In the following decades, concentration in the brewing industry continued to grow, but both production and per capita beer consumption increased. The period between 1950 and 1970 was, like in the USA, a time of great market concentration. The UK brewing sector was dominated by the Big Six: Bass, Allied, Watneys/Grand Metropolitan, Scottish and Newcastle, Courage and Whitbread.146 It is interesting to note that in the 1990s , Bass owned the Czech company Prague Breweries (Pivovary Staropramen).

The six largest companies controlled 80% of the beer market in the United Kingdom in 1970.147 The other companies were more or less regional breweries that supplied their local pubs and other local independent businesses. Pubs that brewed their own beer (the forerunners of traditional microbreweries, for example) all but disappeared from the market.148 They were absolutely unable to compete with the big companies on price.

The above-mentioned large companies began to expand into other sectors, especially leisure, to continue their growth, for example, the company Scottisch and Newcastle operated the hotel chain Thristle Hotels.149 Through these expansions, the large breweries gained control over the customers of their beer. The situation led to many pubs being managed to a large extent by these brewing companies, often through leases. Of the 72,400 operating pubs in 1974, 38,300 (53%) were owned or leased by one of these six large brewing companies. A change in consumer habits occurred in the 1960s, before which consumers preferred lighter beers such as *ales* on tap from cask, *lagers* accounting for only about 1% of consumption. In connection with globalization and marketing strategies in the mass media, *lager* consumption increased from 450,000 hl in 1960 to 4 million hl in 1970. There was also an increase in imports

beer to the United Kingdom by 20%.150 According to Table 13, there were 142 operational breweries in the United Kingdom in 1980, which, when converted per capita, was

145 CABRAS, I. – BAMFORTH, C., *From reviving tradition,* cd, p. 628.
146 Ibid., p. 629.
147 GOURVISH, Terence Richard - WILSON, Richard, G., *The British Brewing Industry, 1830–1980,* Cambridge 1994, p. 253–261.
148 KNOWLES, Tim - EGAN, David, *The Changing Structure of UK Brewing and Pub Retailing,* International Journal of Wine Marketing, 2001, 13, 2, p. 59–72.
149 GILBERT, David C. - SMITH, Rachael, *The UK Brewing Industry: Past, Present and Future,* Inter-National Journal of Wine Marketing, 1992, 4, 1, p. 19–27.
150 CABRAS, Ignazio, *Beer on! The Evolution of Micro- and Craft Brewing in the UK,* in: GARA-VAGLIA, Christian – SWINNEN, Johan (edd.), *Economic Perspectives on Craft Beer,* Cham 2018, p. 377.

CAMRA logo
Source: *CAMRA, available online: <https:// www.brewersjournal.info/ wp-content/ uploads/ 2016/06/ CAMRA.jpg>* [14. 4. 2019].

less than in the then Czechoslovak Socialist Republic. This was followed by a significant turning point in the entire British brewing industry, which was largely driven by consumers themselves. On 16 March 1971, the consumer organisation Campaign for Real *Ale* (CAMRA) was founded in Kruger's Bar in Dunquin , Kerry, Ireland . It was founded by four people: Michael Hardman, Graham Lees, Jim Makin and Bill Mellor.151 The organisation's original name was the Campaign for the Revitalisation of *Ale* . By 1973, the organisation had 5,000 members, in 2009 it had reached 100,000 members and in 2018 CAMRA reported 188,000 members.152

CAMRA states that the aim is to have high quality real *ale,* cider and perry153 and own thriving inns and clubs in every community.
On its website, CAMRA states its principles in points:

ÿ *We are independent and our principles and goals of our movement are set by our membership.*

ÿ *CAMRA's decision-making process is completely independent of any commercial companies or other organisations.*

ÿ *We are a non-profit and all our profits are used back to achieve our goals our movement.*

ÿ *We are consumers. We have no commercial interests in the ownership or management of pubs or breweries.*

ÿ *We are non-political.*

It is thus clear that the scope of the organization is somewhat broader than it might seem at first glance. It emphasizes not only a quality product, but also the culture associated with its consumption.

151 Campaign for Real Ale, The History of CAMRA, available online: <http://www.camra.org.uk/key-events-in-camra-s-history> [7 August 2018].
152 Campaign for Real Ale, About CAMRA, available online: <http://www.camra.org.uk/about> [7. 8. 2018].
153 Cider is a fermented drink made from apples, perry is a fermented drink made from pears.

The emergence of microbreweries in the United Kingdom can be divided into three waves. The first wave can be dated to the late 1970s and mid-1980s.154 Consumer habits gradually changed , and many Britons became dissatisfied with the unification of the beer market and the high degree of concentration in the beer market. It should be noted, however, that this situation occurred in practically all developed countries of the time that were not centrally controlled. Centrally planned economies could not have done anything like this. It was not only CAMRA that pushed for a massive return to *ale,* which would be produced using traditional methods, unpasteurized and unfiltered. In particular, it should not be pushed from a keg using various types of gases (e.g. carbon dioxide or biogas), but by a hand pump using ordinary atmospheric air. CAMRA was also quite successful on the marketing side, changing the perception of the traditional drinker by the majority of society. The consumer began to be perceived significantly more positively. All this resulted in the emergence of new and traditional beer brands *(ales)* on a large scale and the beginning of various beer festivals. CAMRA thus created the perfect breeding ground for the emergence of microbreweries, consumers began to perceive *ale* -type beers more prestigious, which is absolutely crucial for microbrewery production from an economic point of view.

However, microbreweries were still unable to reach the level of the so-called big six in terms of costs. The first wave concerned microbreweries and small breweries whose operators already had some previous experience in the brewing industry, for these operators it was attractive that the demand for real ale had increased.155 A certain group of subjects entering the market were also home brewers, who, however, often did not have the necessary education. Various types of small equipment for home beer production began to appear on the market . *Ale* is less demanding to produce than *lager ,* which is especially true for domestic conditions .

New entrants to the market focused primarily on their immediate region. There were three reasons:

1. It is much easier to create a sense of belonging to a given beer in consumers from a given location than it is in consumers from more distant locations.
2. Unpasteurized and unfiltered beers do not have nearly as long a shelf life, so transporting them over longer distances usually means a loss in quality.
3. Transporting beer over longer distances and possibly exporting it requires increased transaction (especially distribution) costs, which for smaller production units (microbreweries) can have a strongly negative impact on the economy.

In the period after the establishment of CAMRA, more than half of new breweries were opened in villages or on detached farms. In the period before the establishment of the organisation, breweries were mainly located in urban areas.

154 CABRAS, I. – BAMFORTH, Ch., *From reviving tradition,* cd, p. 631.
155 MASON, Colin M. - MCNEILL, KN, *Market Change, Distribution, and New Firm Formation and Growth: The Case of Real-Ale Breweries in the United Kingdom,* Environment and Planning A, 1997, 95, 2, p. 405–417.

Equipment diluting "beer concentrate" to the required degree - HGB
Photo: *Author's archive*

agglomerations.156 A significant economic impetus for the establishment of microbreweries in the United Kingdom was the establishment of the European Regional Development Fund (1975), which aimed to support less developed regions throughout the then European Community, especially rural regions. A number of business plans, not only in the field of brewing, would not have been implemented at all without the so-called European money.

The second wave of microbrewery establishment occurred in the early 1990s, after a period of stabilization when the number of new breweries matched the number of closed breweries.157 The microbrewery industry was no longer just a target for enthusiasts and people previously associated with brewing, new microbreweries were also being established by those who had little or no experience with brewing. These included people who wanted to radically change their careers. This era is characterized by even greater economic pressure on traditional large breweries. Cost-effective technologies are beginning to be applied on a large scale, such as diluting beer with water before bottling158 or replacing hops with various hop extracts, which had a rather drastic impact on Czech hop growing in the 1990s, when global brewing companies stopped purchasing Žatec semi-early red ale in large quantities.

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156 SWANN, Peter GM, *The Fall and Rise of the Local Brew: Process Innovation, Horizontal Product Innovation and the Geographic Dispersion of Breweries in England, 1900–2004,* text presented at the DRUID Summer Conference, subtitled "Opening Up Innovation: Strategy, Organization and Technology", Imperial College London Business School, 2010.

157 KNOWLES, T. - EGAN, D., *The Changing Structure,* cd, p. 59–72.

158 English High Gravity Brewing – HGB; stronger beer is produced, sometimes even beer concentrate, and just before being bottled into transport containers, it is diluted with degassed water. This significantly saves energy costs in the brewery and during subsequent fermentation, because a smaller volume is used. However, such beer often has to be artificially carbonated, has a less stable foam, so various artificial stabilizers are used to improve it, and the resulting product is of lower sensory quality. Originally, this technology was intended to slightly fine-tune the alcohol content, but today there are breweries that, for example, dilute beer from an 18-proof concentrate to a final nine.

Society of Independent Brewers (SIBA) logo
Source: *SIBA, available online: <https:// craftybeeress.files.wordpress.com/ 2018/02/ default-siba-logo-black-on-clear.png>* [14. 4. 2019].

In 1989, government regulation also made it much easier to enter the industry. In 1989, the Commission for Monopolies and Mergers issued a report recommending that the large breweries (the Big Six, see above) divest 14,000 pubs. The Commission argued that this would reduce retail prices and increase consumer choice.159 In the same vein, the Beer Orders Act was passed in the same year. This was intended to significantly reduce vertical integration between retail and producers, who had a very significant influence in the retail sector. The legislation largely freed many pubs from the large breweries. The stricter separation of the producers' and traders' branches in the product vertical lowered the barriers to entry into the industry. All this led to a significant increase in the number of producers of traditional British *ale,* who were able to penetrate pubs more freely, but this did not mean a decrease in the concentration of the industry, as the four most important companies increased their market share in the domestic market from 75% to 84% between 1989 and 1991 , with regional breweries holding 15% .160 In 1991, Courage and Grand Metropolitan merged.

The third wave of microbreweries began at the beginning of the new millennium and saw another significant increase in their numbers. Brewing technology developed and barriers to entry were lowered, making microbrewery equipment cheaper, more compact and easier to install.161 In 2002, the Gordon Brown government in the United Kingdom introduced a progressive beer tax, which supported small producers. Much of this was due to lobbying by the Society of Independent Brewers.

159 WATERSON, Michael, Beer - The ties that bind, available online: <http://wrap.warwick.ac.uk/3529/1/WRAP_Waterson_twerp_930.pdf> [20. 11. 2018].
160 PREECE, David - STEVEN, Gordon - STEVEN, Valerie, *Work, Change and Competition: Managing for Bass,* London 1999. p. 230.
161 WYLD, John - PUGH, Geoff - TYRALL, David, *Evaluating the impact of progressive beer duty on small breweries: A case study of tax breaks to promote SMEs,* Environment and Planning C: Politics and Space, 2010, 28, 2, p. 226.

(Society of Independent Brewers – SIBA). This organisation was founded in 1980 in connection with the growth in the number of small independent breweries entering the industry. The introduction of tax relief meant that breweries paid half the excise duty for the first 5,000 hl of beer produced annually, and tax progression applied up to 30,000 hl, which was increased to 60,000 hl in 2004. Breweries established at this time, with a few exceptions, still fit within the capacity limit for tax relief. As in other countries, in the United Kingdom , the last economic crisis of 2008 significantly helped small breweries, or rather, the number of microbreweries and craft breweries continued to grow during this crisis . According to UHY Hacker Young, there were 1,994 breweries in the UK in 2016 , with 300,162 being established in 2016. For 2018, SIBA lists its membership at 825,163

Table 14: The brewing sector in the United Kingdom

UK	2010	2011	2012	2013	2014	2015	2016
Production (million hl)	44,997	46,605	44,239	44,186	44,336	44,039	43,734
Consumption (million hl)	45,873	44,844	42,962	42,422	43,752	43,762	43,731
Consumption per capita (l)	69	67	67	66	68	67	67
On-trade (%)	–	52	53	51	50	49	48
Off-trade (%)	–	48	47	49	50	51	52
Imports (thousands of hl)	–	8,730	9,056	8,808	8,503	9,035	10,585
Exports (thousands of hl)	–	6,884	6,463	6,559	5,242	5,650	5,965
Number of breweries	828	948	1,300	1,490	1,700	1,880	2,250
Number of microbreweries	778	898	1,252	1,442	1,648	1,828	2,198

Source: *Brewers of Europe*

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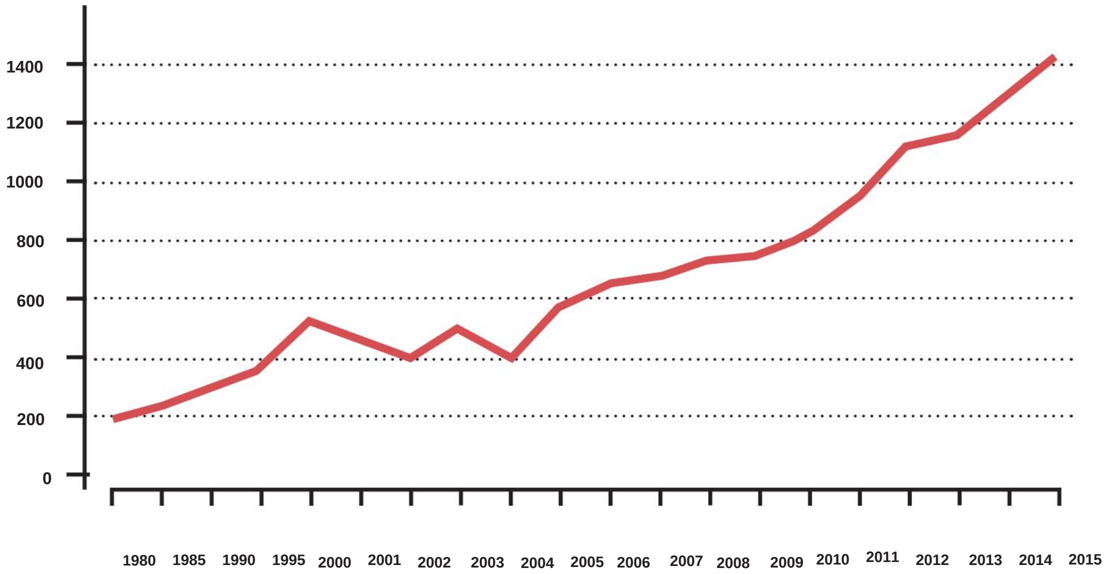
Basic data on brewing in the United Kingdom is provided in Table 14, which takes into account the entire industry, not just microbreweries. For example, unlike Austria or Germany, the United Kingdom is characterized by low beer consumption per capita, which in 2016 amounted to only 67 liters. The positive thing is that almost half (48%) of beer was consumed in restaurants. The increase in the number of breweries , or microbreweries, is very striking. In 2016, there were 34.07 breweries and 33.28 microbreweries per 1 million inhabitants .

The number of breweries in the United Kingdom increased steadily from 1980 to 2015 , as shown in Figure 16. Growth in the number of individual breweries

162 The Guardian, Craft beer boom pushes number of UK breweries past 2,000, available online: <https://www.theguardian.com/lifeandstyle/2017/oct/23/craft-beer-boom-pushes-number--of-uk-breweries-past-2000> [11. 8. 2018].

163 The Society of Independent Brewers, available online: <http://www.siba.co.uk/> [11. 8. 2018].

Chart 16: Development of the number of breweries in the United Kingdom from 1980 to 2015



Source: *British Beer & Pub Association*

is due to the growth in the number of craft breweries and microbreweries. The graph also shows the three aforementioned phases of development, when the market temporarily "overheated" and the number of breweries subsequently decreased.

5.3 SLOVAKIA

At first glance, it might seem that the microbrewery boom in Slovakia is similar to the Czech one, but the opposite is true. Microbreweries in Slovakia are far from having the same support from consumers as in the Czech Republic; the situation only began to change after 2015. The reasons for this difference will probably have to be sought in the past and in the historical development of beer culture in both countries. Czech beer culture has undergone a similar development to that of Austria or Bavaria. The development of Slovak beer culture was probably determined by the fact that the country was part of the Kingdom of Hungary for centuries. This is most evident in the basic quantitative indicator of the entire sector, which is beer consumption per capita. Slovakia has roughly half the consumption per capita of its western neighbor. Beer consumption in Slovakia has never reached a level of over 100 liters, and Slovak consumers prefer wine or spirits much more.

Table No. 15: Slovak brewing sector

Slovakia	2010	2011	2012	2013	2014	2015	2016
Production (million hl)	3,112	3,123	3,206	2,883	2,648	2,434	2,312
Consumption (million hl)	3,609	3,997	4,141	3,874	3.72	3,959	3.97
Consumption per capita (l)	72	24	76	72	69	73	73
On-trade (%)	–	40	40	40	40	40	40
Off-trade (%)	–	60	60	60	60	60	60
Imports (thousands of hl)	–	1,026	1,107	1,157	1,272	1,626	1,509
Exports (thousands of hl)	–	135	171	290	200	92	127
Number of breweries	19	25	30	38	44	60	70
Number of microbreweries	14	20	26	33	39	45	60

Source: *Brewers of Europe*

In 2003, per capita consumption reached 90 liters. In 2003, beer production in Slovakia was 4.670 million hl, and between 2003 and 2014, per capita consumption decreased by 21.5%.164 The Slovak market shows one very significant anomaly by Central European standards: In 2016, more than 40% of Slovak consumption was covered by imports, and this value also had an upward trend. In 2016, imports reached 1.509 million hl, of which 1.148 million hl came from the Czech Republic, or 76% in relative terms. It can therefore be concluded that the entire Slovak brewing sector is under significant influence of Czech brewing. In addition, a number of Czech brands are still produced in Slovakia under license, the largest in terms of quantity being the Velkopopovický Kozel brand.

There are only four industrial breweries operating in Slovakia: Heineken Slovakia with its brewery in Hurbanov, Plzeÿský Prazdroj Slovensko (until 2018 the company was called Pivovary Topvar) in Veÿký Šariš, Banská Bystrica Brewery and Steiger Brewery. However, the Slovak beer market is dominated by the first two companies . The first is 100% owned by the multinational Heineken, the second is owned by the multinational Japanese company Asahi. Together, they control around 90% of the Slovak beer market, which can already be seen as a duopoly . It is interesting that both of these breweries were established as new ones during the communist era. The brewery in Veÿký Šariš was founded in 1967, the Hurbanov brewery two years later. The two remaining smaller companies are small independent breweries , therefore they benefit from tax benefits. In Slovakia , companies are divided into only two categories for excise duty purposes , the dividing value being the annual beer production of 200,000 hl. The Steiger brewery is 90% owned by the British financial company Endemit and 10% by the Czech brewing company PMS Pÿerov. The Banská Bystrica brewery is known for its Urpiner brand and is fully in Slovak hands.

164 POKRIVÿÁK, Jan – LANÿARIÿ, Drahoslav – SAVOV, Radovan – TÓTH, Marián, *Craft Beer in Slovakia,* in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, Cham 2018, p. 339.

Coaster of Perla Banská Bystrica brewery
Source: *Vladimír Gerlich Archive*

The history of Slovak microbreweries began in 1992, when the Nutters founded the Perla restaurant microbrewery in Banská Bystrica. It had a 20 hl brewhouse, which is not entirely typical for a typical restaurant microbrewery.
Fermentation took place in closed cylindrical-conical tanks. He produced light twelve (later eleven and dark fourteen), and occasionally also wheat beer.
However, production at this microbrewery was definitively terminated at the end of 2016. Its annual production was around 1,000 hl, but its capacity could have been much higher given the size of the brewery.

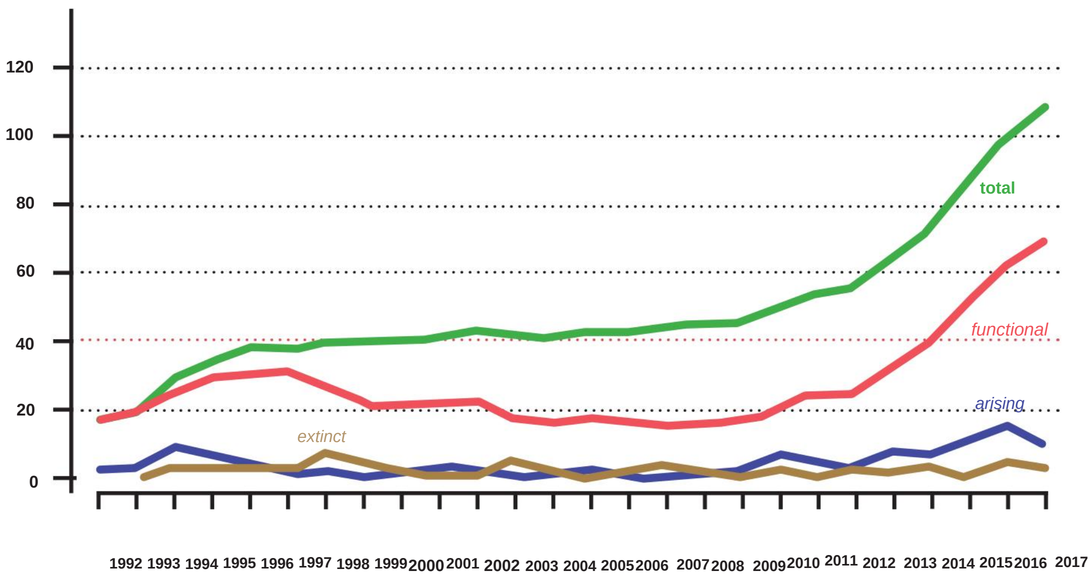
Asociácia
malých
nezávislých
pivovarov
Slovenska

Logo of the Association of Small Independent Breweries of Slovakia
Source: *Association of Small Independent Breweries of Slovakia, available online:* *<https:// www.malepivovary.sk/ files/ design/ logo/ logo-large.png>* [14. 4. 2019].

In Slovakia, there were three breweries in 2018 that were founded in the 1990s . They were: the Amadeus brewery in Šurany, which was founded in 1997; the Dobrovar brewery in Dobrá Niva, which was established in 1994 and is thus the oldest functioning Slovak microbrewery; and finally the Kaltenecker brewery from Rožÿava. It was opened in 1997 as a typical restaurant brewery, but in 2012 a new production plant was built with an annual capacity of up to 15,000 hl. The original Kaltenec-ker microbrewery remained in operation. This is a similar strategy to that applied by the Zichovec microbrewery in the Czech Republic.

In 2009, the Association of Small Independent Breweries of Slovakia was founded, at that time the situation in the sector in Slovakia was quite bleak. There were two hegemons: Heineken Slovakia and Pivovary Topvar. Both companies controlled over

Chart No. 17: Development of the number of breweries in Slovakia (1992–2017)



Source: *Association of Small Independent Breweries of Slovakia*

90% of the Slovak beer market and there were only seven small breweries,165 five of which had an annual production of less than 10,000 hl. As can be seen from Table 15, there were already 60 microbreweries in Slovakia in 2016. The Association of Small Independent Breweries of Slovakia states on its website that in 2018 the number of microbreweries in Slovakia exceeded 70.

Graph No. 17 clearly shows the quantitative development of the number of breweries in Slovakia, including industrial breweries. The most breweries closed in 1999 (7 in total). This year, the so-called Russian economic crisis broke out in full force, so consumers began to save significantly, which was subsequently reflected in the business sector. The most successful year in terms of the number of microbreweries established was 2016, when a total of 15 microbreweries were established. As in the Czech Republic, 2010 was largely a turning point, when there was a significant increase in the dynamics of microbrewery establishment. An unusually long period of stagnation can be observed between 1998 and 2009.

In 2016, there were 12.86 breweries and 11.03 microbreweries per million inhabitants of Slovakia .

165 Association of Small Independent Breweries of Slovakia, Kto sme?, available online: <https://www.malepivovary.sk/> [12. 8. 2018].

5.4 IRELAND

The Republic of Ireland gained its independence only after World War I. In terms of brewing, the most famous brand globally is undoubtedly Guinness, but it is currently produced under license in 49 countries around the world,166 and the original from Dublin is usually not imported to the Czech Republic.

In Ireland, pale bottom-fermented beers have never been significantly dominant, nor has there been such pressure to homogenize the beer market as in the neighboring United Kingdom . Ireland has always maintained its product heterogeneity to a large extent, unlike, for example, the United States of America, the United Kingdom or the Czech Republic . Non-lager beer styles have not been so rare for consumers. The Irish are great beer patriots, focusing largely on top-fermented *stouts,* and recently top-fermented Irish ales have also come to the fore .

In 2015, there were 48 microbreweries in production in Ireland, and a year later there were 62. Microbrewery production in 2015 was at the level of 134 thousand hl,167 which meant a share of consumption in the Irish market of approximately 3%. In addition to the 62 microbreweries, there were a number of flying breweries. The share of microbreweries in total Irish production would be significantly lower, because Ireland is a significant net exporter of beer and microbreweries hardly export, but it is clear that the volume of the Irish microbrewery market in terms of production volume doubles every two years. The Irish beer market in figures is summarized in Table 16.

Table 16: Irish brewing sector

Ireland	2010	2011	2012	2013	2014	2015	2016
Production (million hl)	8,249	8,514	8,195	8,008	7,288	7,755	7.68
Consumption (million hl)	4,814	4,721	4,677	4,328	4,481	4,414	4,576
Consumption per capita (l)	90	86	86	79	81	80	81
On-trade (%)	–	65	61	64	64	67	66
Off-trade (%)	–	35	39	36	36	33	34
Imports (million hl)	–	2,607	1,605	1,264	1,344	1,208	1,176
Exports (million hl)	–	3,831	3,518	3,988	2,807	3,335	3,104
Number of breweries	26	26	26	30	50	64	93

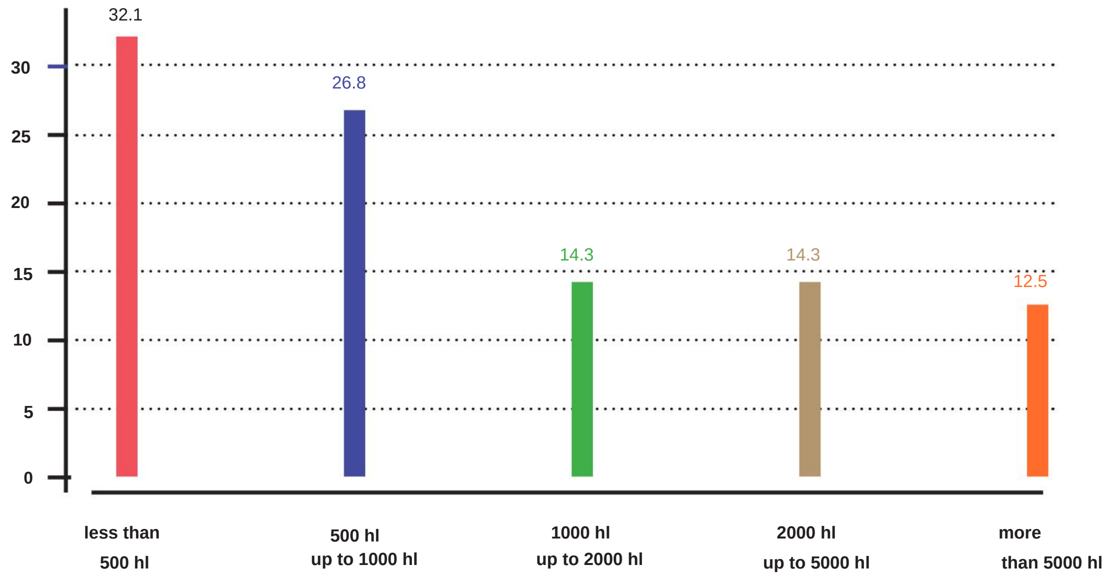
Source: *Brewers of Europe*

166 Guinness Storehouse, Guinness Facts, available online: <https://www.guinness-storehouse.com/content/pdf/factsheets/factsheet_pdf_10.pdf> [20. 9. 2018].

167 Craft Beer and Microbreweries in Ireland, 2016, A Report for the Independent Craft Brewers of Ireland and Bord Bia, available online: <https://www.bordbia.ie/globalassets/bordbia.ie/industry/marketing-reports/consumer-reports/craft-beer-and-microbreweries-in-ire-land-2016.pdf> [20. 9. 2018].

Machine Translated by Google

Chart No. 18: Distribution of Irish microbreweries in relative frequencies (2015)



Source: *FEENEY, Bernard,* Craft Beer and Microbreweries in Ireland, *available online: <https:// www.bordbia.ie/ globalassets/ bordbia.ie/ industry/ marketing-reports/ consumer-reports/ craft-beer-and-microbreweries-in-ireland-2016.pdf>* [14. 4. 2019].

Graph 18 shows the statistical distribution of microbrewery sizes by frequency of presence. In 2015, there was a clear inverse relationship between the production size of microbreweries and their numbers. As for the capacity of the Irish microbrewery sector, it is estimated at 400,000–450,000 hl per year, which could lead to a market share of up to 10%, or Irish consumption.168

The most common type of microbrewery in Ireland was the typical restaurant microbrewery.

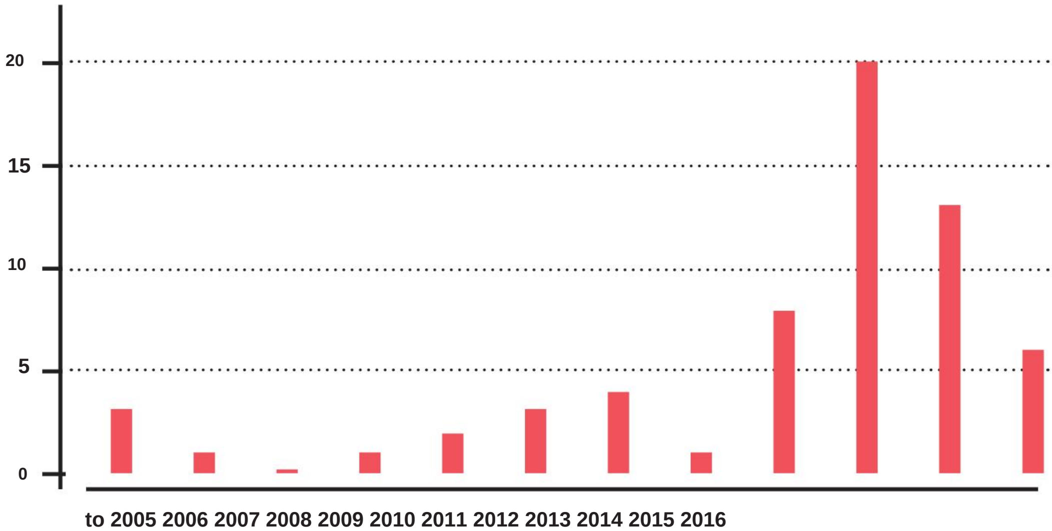
Brewery with a production volume of up to 500 hl per year.

According to Feeney, the year-on-year increase in microbrewery production in 2015 was 56% from 86 thousand hl. For 2016, microbrewery production is reported at 197 thousand hl,169 which would represent a share of Irish consumption of 4.3%. This Irish study even reports the total number of workers in the microbrewery sector, which is calculated

168 Craft Beer and Microbreweries in Ireland, 2016, A Report for the Independent Craft Brewers of Ireland and Bord Bia, available online: <https://www.bordbia.ie/globalassets/bordbia.ie/in-dustry/marketing-reports/consumer-reports/craft-beer-and-microbreweries-in-ireland-2016.pdf> [1. 9. 2019].

169 Craft Beer and Microbreweries in Ireland, 2016, A Report for the Independent Craft Brewers of Ireland and Bord Bia, available online: <https://www.bordbia.ie/globalassets/bordbia.ie/in-dustry/marketing-reports/consumer-reports/craft-beer-and-microbreweries-in-ireland-2016.pdf> [20. 9. 2018].

Chart No. 19: Overview of microbrewery establishment in Ireland



Source: *FEENEY, Bernard, Craft Beer and Microbreweries in Ireland, available online: <https:// www.bordbia.ie/ globalassets/ bordbia.ie/ industry/ marketing-reports/ consumer-reports/ craft-beer-and-microbreweries-in-ireland-2016.pdf>* [14. 4. 2019].

to permanent employees. The conversion is necessary mainly because of seasonal and temporary employees and part-time employees. In total, there are 439 of them in the entire microbrewery sector, including flying breweries, which is 4.87 workers per microbrewery. In the case of production microbreweries, this is 399 employees, so that on average it is 6.4 per microbrewery. Unfortunately, the study does not provide an in-depth methodology, in particular it does not state whether flying microbreweries are included and also to what extent the employees of a possible restaurant facility logically connected to the microbrewery are included in the number of employees. The study also provides a converted number of employees for the "flying" part of the sector of 40, so here it would be 1.4 employees per flying brewery, which could largely correspond to Czech conditions. In terms of the volume of production, a microbrewery in Irish conditions is defined as up to 40,000 **hl.170**

Chart 19 shows an overview of the establishment of microbreweries in Ireland in the period 2005–2016. This development must be seen in an economic context. Ireland is one of the EU countries that was most affected by the financial crisis that broke out at the turn of 2007/2008. While in other countries the financial crisis practically did not affect the microbrewery and craft brewery segment, it hit Ireland with enormous intensity.

170 Office of the Revenue Commissioners, How do breweries qualify for the relief?, available online: <https:// www.revenue.ie/en/companies-and-charities/excise-and-licences/alcohol-prod-ucts-tax/microbreweries-establishment-and-relief/how-do-breweries-qualify-for-the-relief. aspx> [1. 9. 2019].

Table 17: Development of beer consumption per capita in Ireland

2003	113.0
2004	108.0
2005	106.0
2006	105.5
2007	98.6
2008	91.0
2009	91.0
2010	90.0
2011	86.0
2012	86.0
2013	79.0
2014	81.0
2015	80.0
2016	81.0

Source: *Brewers of Europe*

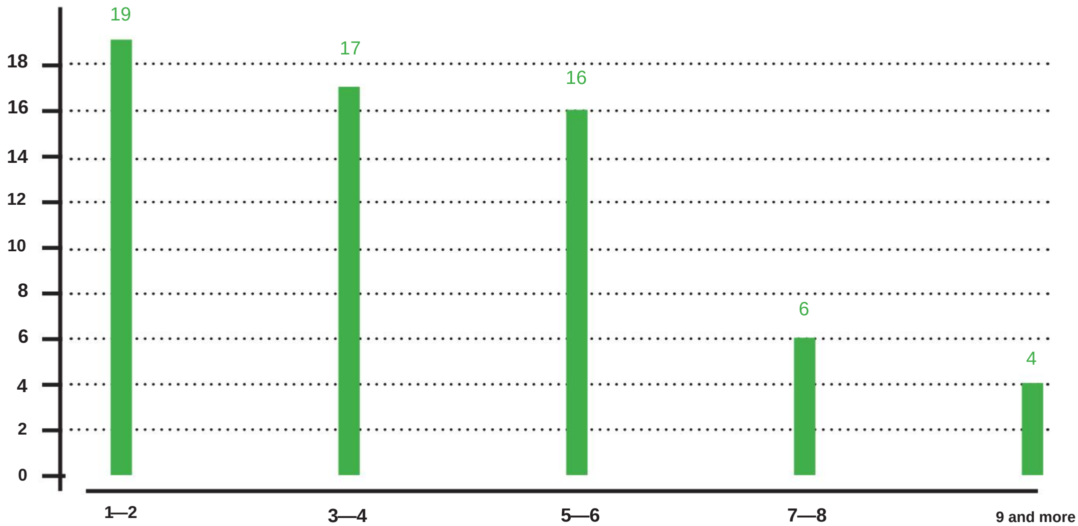
Guinness is an Irish national symbol
Source: *Guinness Brewery, available online: <https:// www.guinness.com/ en/ search/?q=logo>* [14. 4. 2019].

The crisis also resulted in a huge drop in per capita beer consumption, which was unprecedented in European conditions. At the beginning of the second millennium, per capita beer consumption in Ireland was the fourth highest in Europe and the world, behind the Czech Republic (160.9 l), Germany (117.8 l) and Luxembourg (115.9 l).

According to Table 17, there was a 28% drop in beer consumption between 2003 and 2016, which also significantly affected the microbrewery sector, which did not have suitable conditions for further development.

A very valuable source of information in Bernard Feeney's study is the number of distribution channels used by individual microbreweries. Information about them is provided in Chart No. 20. Feeney works with a total of 62 microbreweries in his study, from which he was able to obtain data.

Chart No. 20: Number of distribution channels used by individual microbreweries (2016)



Source: *FEENEY, Bernard, Craft Beer and Microbreweries in Ireland, available online: <https:// www.bordbia.ie/ globalassets/ bordbia.ie/ industry/ marketing-reports/ consumer-reports/ craft-beer-and-microbreweries-in-ireland-2016.pdf>* [14. 4. 2019].

The vast majority of microbreweries are those with no more than six distribution channels, together representing 84% of all microbreweries. Microbreweries with more than six distribution channels are represented by only 16% and can be expected to be larger microbreweries, not pure restaurant microbreweries.

The Irish microbrewery sector has very interesting indicators for the packaging in which beer is bottled, see table no. 18. As expected, most of the beer is bottled in KEG barrels, this method of bottling is used by 94.6% of microbreweries. The high proportion of bottles is interesting, namely 86.5%. The absolute extreme is the proportion of cans, reaching 24.3%,
which is completely unimaginable for the Czech market, for example. In the Czech Republic at the beginning of 2019, there was only one microbrewery bottling into cans; it was the Dva kohouti microbrewery.

KEG is a classic stainless steel barrel, into which *lagers* are usually poured , beer is pasteurized and atmospheric air is usually not used for tapping. Cask is a barrel into which beers of the British Isles are poured *(ale, porter, stout* , etc.), and mainly from this type of barrel the beer is forced out by atmospheric air. The lever on the tapping device also serves as a mechanical lever for pumping atmospheric air into this type of barrel.

Cask type barrels
Source: *Craft Beer & Brewing, available online: <https:// images.ctfassets.net/ qe08557i7rmu/ VpU-6ygAABcZgKz_/ abe734c37c46243cf7f91bc308ec7f63/40e485a967f1bb938840a8f723b4a8946b1988ae_ british-cask-ale-1.jpg>* [14. 4. 2019].

Table No. 18: Beer bottling in microbreweries by packaging type (2015)

Packaging type	Microbreweries	Relatively (%)
Bottle	32	35.6
Can	9	10.0
Cask	14	15.6
KEG	35	38.9

Source: *FEENEY, Bernard, Craft Beer and Microbreweries in Ireland, available online: <https:// www.bordbia.ie/ globalassets/ bordbia.ie/ industry/ marketing-reports/ consumer-reports/ craft-beer-and-microbreweries-in-ireland-2016.pdf> [14. 4/2019]*

Although the Irish microbrewery segment is small based on previous indicators, it is showing enormous dynamics in its development, whether it concerns its share of the overall brewing market, its growth or the number of jobs it creates.

Ireland had 19.55 breweries (including flying ones) per million inhabitants and 13.03 microbreweries (excluding flying ones) per million inhabitants in 2016 .

5.5 BELGIUM

If we are looking for a country that is small and yet exhibits a huge heterogeneity of beer styles, Belgium is it. In terms of total beer production, it is comparable to the Czech Republic. Beer production in Belgium as a whole amounted to 20.616 million hl in 2016. In terms of quantitative indicators, Belgium's brewing sector holds one major primacy – of all countries in the world, it exports the largest share of its production, in 2016 it was a full 68%. Moreover, this trend is growing, in 2011 exports reached almost 60%. The reason lies in the fact that exported beers generally do not start to age immediately after being bottled, losing quality, but quite the opposite. They benefit more from being stored in bottles, and are therefore suitable for storage and therefore for export. This is characteristic of two typical Belgian beer styles, which are *Belgian (abbey) ale* and spontaneously fermented *lambic* or *gueuze beers.*

Table 19: Belgian brewing sector

Belgium	2010	2011	2012	2013	2014	2015	2016
Production (million hl)	18,122	18,571	18,751	18,138	18,207	19,811	20,616
Consumption (million hl)	8,439	8,574	8,228	8,092	8,095	7,951	7,689
Consumption per capita (l)	78	78	74	72	72	71	68
On-trade sales	–	46	46	45	45	44	44
Sales Off-trade	–	54	54	55	55	56	56
Imports (thousand hl)	–	1,094	1,163	1,028	1 111	1,164	1,158
Exports (million hl)	–	11,091	11,686	11,074	11,222	13,025	14,085
Number of breweries [171]	135	123	150	160	168	199	224

Source: *Brewers of Europe*

Moreover, these beers usually have a higher unit price (for example, the price per half liter) than most other beers, so that transaction (especially transportation) costs are much better distributed into the final price. For comparison, examples from 2017 can be given: According to the Czech Statistical Office, the price per liter of Czech bottled beer exported to Belgium was 25 CZK, while the price per liter of Belgian bottled beer imported to the Czech Republic was 32 CZK.

It may not seem like that today, but Belgium was probably the country with the highest density of breweries in the past. According to Table 20, there were an incredible 3,223 breweries in Belgium in 1900, and ten years later there were even 3,349 breweries. The average output per brewery was less than 5,000 hl of beer. This situation was very atypical at the height of the Industrial Revolution, in all other countries of the world the number of breweries was

171 The Brewers of Europe organization does not provide data on the number of Belgian microbreweries.

Table No. 20: Historical development of Belgian brewing

	Number of breweries	Exhibitions (thousands of hl)	Average production per brewery (thousand hl)
1900	3,223	14,632	4.54
1910	3,349	16,008	4.78
1920	2,013	10,407	5.17
1930	1,546	16,666	10.78
1934	1,362	14,723	10.81
1940	1,120	10,237	9.14
1946	755	10,804	14.31
1950	663	10,137	15.29
1960	414	10 110	24.42
1995	305	11,093	36.37
1968	256	11,894	46.46
1970	232	13,015	56.10
1973	190	14,691	77.32
1975	174	13,796	79.29
1977	159	13,819	86.91
1980	123	14,291	116.19

Source: *POELMANS, Eline - SWINNEN, Johan FM,* A Brief Economic History of Beer, *in: SWINNEN, Johan FM (edd.), The Economics of Beer, Oxford 2011, p. 20.*

breweries was already declining significantly at this time due to pressure from larger brewing companies .

It is said that breweries, especially those in rural areas, were often used for political and religious rivalry. It is said that even in smaller villages there were usually two breweries, one Catholic and the other Protestant, and their owners often competed for political influence in the village leadership. They used their breweries to try to influence voters.

Like most European countries, Belgium and its brewing sector were negatively impacted by three external influences in the 20th century:

1. World War I,
2. the global economic crisis,
3. World War II.

All three of these events led to a decline in the number of breweries and a shortage of raw materials and other factors of production. The lack of finance caused by the wars and the crisis led to breweries being undercapitalized, often losing their brewhouses to military confiscation. In addition, there was a shortage of workers who had been employed during both wars.

Brewhouse of the Westmalle Trappist Brewery
Photo: *Author's archive*

sent to the front. After World War II, globalization trends penetrated Belgium , and market concentration and unification took their toll on the variety of beer styles, although not as much as in most developed countries at the time. Belgium gave the world, or rather is most associated with, three groups of beer styles:

1. *Belgian abbey ale,*
2. spontaneously fermented beers,
3. *witbier.*

Belgian abbey ales are heavier top-fermented beers associated with Belgian monasteries. The very nutritious beer could be consumed during times of fasting. During the 19th and 20th centuries, stronger versions of this beer began to be brewed. The original *Belgian abbey ale* was actually a weak Belgian *brown but* with an alcohol content comparable to a typical Czech *lager.* It then developed into stronger variants, which was precisely at a time when monasteries were starting to open up to the world more. The first *dubbel* was supposedly brewed in the still-functioning monastery brewery of the Trappist monastery in Westmalle in 1856.172 A dark-coloured *dubbel* usually has around 7% alcohol. A hundred years later , in 1956, the first *tripel was brewed in the same brewery,* which usually has 8–9% alcohol. Previously, it was predominantly dark, but today it exists more in light

172 Hopfen Helden, Beer Style Guide: Abbey DUBBEL beer, available online: <https://www.hopfenhelden.de/en/beer-style-guide-abbey-dubbel-beer/> [16. 8. 2018].

Brewhouse of the Rochefort Trappist Brewery
Photo: *Author's archive*

variant. A very strong *Belgian ale* is *quadrupel,* which usually has 10 % or more alcohol and is associated with the Dutch Trappist brewery La Trappe, but it is not the strongest Trappist beer. That is Rochefort 10, which has 11.3% alcohol , which is already at the limit of technological possibilities. For brewer's yeast, such an alcohol content becomes toxic.

Spontaneously fermented beers are also a regional affair in Belgium and over the last century their prestige, or rather their perception by the public, has completely changed. A hundred years ago they were beers intended primarily for farmers in the countryside, today they are very often appreciated and sought after by true beer lovers. They are produced only southwest of Brussels in the Pajottenland region (the valley of the Zenne/Senne river) and their production uses unmalted wheat, old hops (sometimes even Saatchi semi-early red) and, most importantly, the wort is not fermented with cultural yeast. The work is fermented by microorganisms that enter the cooling wort from the air. That is why this style is produced only in the Pajottenland region, which is very specific for its airborne microorganisms. These beers are brewed only in the winter season. The most famous beer of this group is *lambic ,* which is specific in that it is aged for 1–3 years.173 A mixture of old and young *lambic* is called *gueuze.* Due to its high acidity (pH is around 3), beers are often flavoured with fruit or sugar. This beer style is produced in the Czech Republic with international success by the Mikulov microbrewery Wild Creatures.

173 OLŠOVSKÁ, J. – ÿEJKA, P. – ŠTÿRBA, P. – SLABÝ, M., *Sensory analysis of beer,* cd, p. 123.

Pierre Celis saved the witbier style from extinction

Source: *Wikipedia Commons, available online: <https://upload.wikimedia.org/wikipedia/en/thumb/d/d9/Pierre_celis.jpg/330px-Pierre_celis.jpg>* [14. 4. 2015].

Finally, the third typical representative of Belgian beers is *witbier,* sometimes called *witt.* It is a beer brewed from malted barley and unmalted wheat, with various ingredients added, such as coriander and orange peel. The beer is generally unfiltered and served unpasteurized. The most famous representative of this beer style is undoubtedly the Hoegaarden brand. This beer style has a very interesting history, intrinsically linked to the emergence of craft breweries in Belgium. After World War II, *witbier* seemed doomed to extinction under the pressure of bottom-fermented, filtered beers – *lagers.* Hoegaarden is a city where *witbier* was historically produced on a large scale. In 1758, the village of Hoegaarden had 2,000 inhabitants and 38 breweries, or one brewery for every 58 inhabitants.174 The last brewery in Hoegaarden was Tomsin, but it ceased production in 1957.175 In 1966, Pierre Celis (1925–2011), who had previously worked for Tomsin and therefore knew the production process, entered the scene. He opened his own brewery called Brouwerij Celis (Celis Brewery).176 He was successful, and later bought a lemonade factory, which he converted into a brewery and named De Kluis. In 1980, he began producing his beer there. Unfortunately, in 1985, the building burned down, Celis had no insurance, and so Artois Brewery helped him with the reconstruction, which in turn gained him a new

174 SWINNEN, Johan – BRISKI, Devin, *Beeronomics: How Beer Explains the World,* Oxford 2017, p. 74.
175 YENNE, Bill, *Beer: The Ultimate World Tour,* New York 2014, p. 132.
176 Belgian Beer Journal, REMEMBERING PIERRE CELIS: A CLASSIC BEER STYLE RESURRECTED BY A LEGENDARY BREWER, available online: <https://belgianbeerjournal.com/brewviews/pierrecelis/> [20. 8. 2018].

45% stake in the newly built brewery.177 In 1987, the company acquired the remaining Celis share and began producing beer under the Hoegarden brand.

The Belgian brewing market can historically be described as the most diverse and it retained this characteristic until the beginning of the new millennium, when various and even exaggerated innovations in the USA dethroned it from this position. Bavaria and Belgium are often contrasted in continental Europe . Both countries have an extremely developed beer culture, while Bavaria is relatively conservative thanks to its so-called purity law (Reinheitsgebot) from 1516, Belgium had no such restrictions, so diversity could develop more significantly there.

Table 21: Beer consumption in Belgium (%)

	Lagers	**Low alcohol/non-alcoholic**	**Crafts and others total**	Trappist	Monastic	Spontaneous special
1947	55	45				
1975	80	10	10			
1980	76	7	17	7	10	
1990	74	5	21	5	4	12
2000	71	3	26	8	3	15

Source: *POELMANS, Eline – SWINNEN, Johanes,* Belgium: Craft Beer Nation?, *in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, Cham 2018, p. 145.*

The change in beer consumption in Belgium is clearly shown in Table 21. It shows that after the Second World War there was a relatively large increase *in lagers,* which symbolize market concentration and globalization. In 1947, *lagers* had a 55% share of consumption, in 1975 this share was already 80%, but then it began to gradually decline. The table classifies producers of monastery beers (including Trappist beers), spontaneously fermented beers and other beers as craft beers. The share of this segment was lowest in 1975, at 10%, then it began to grow again.

The microbrewery, or rather craft brewery, segment has never been completely sidelined or economically liquidated in Belgium. However, the problem of defining a microbrewery or craft brewery arises here.

A very interesting and completely unique brewery in the world is the Trappist brewery in Westvleteren, which has an annual output of around 6 thousand hl, so in terms of production it falls into the category of microbreweries even according to the strictest criteria. In mid-2018, there were twelve Trappist monastery breweries worldwide, and many of them operate as ordinary commercial companies, which is definitely not the case for Westvleteren. Westvleteren has a very interesting business strategy, which lies in the uniqueness of the production. The monks do not respond to the growing demand and keep production very low. Brewery

177 SWINNEN, J. – BRISKI, D., *Beeronomics,* cd, p. 76.

Westvleteren Trappist Brewery bottling plant
Photo: *Author's archive*

It does not have its own distribution network and the beer can only be officially purchased at the monastery gate under relatively strict conditions. On the other hand, there is a de facto black market for this beer, which is distributed over long distances. On the world-famous portal ratebeer.com, this beer was rated the best in the world for four consecutive years (2011–2014) .

Some original monastery beers, which were actually brewed by monks in the past, now only have the brand in common with the monastery, which the monasteries have been leasing to large multinational companies for a long time. Examples include the "monastery " beer Grimbergen, produced by Alken-Maes, or Affligem sold by Heineken . The Belgian original monastery brand Leffe, which is produced by the world's largest brewing company AB InBev, is relatively easily available in the Czech Republic . In 2018, this company owned the Samson brewery in ÿeské Budÿjovice in the Czech Republic.

Table 21 shows that craft beer had the lowest share of consumption in 1980, when it fell to 10%. For 2000, the share is already 26%.
which points to the enormous growth dynamics of the segment. Even in connection with the above information on monastic non-Trappist beers, it is not surprising that this segment recorded a decline of one percentage point between 1990 and 2000, while Trappist beers, on the other hand, strengthened from 5% to 8%.

Trappist beers are probably the most prestigious beers in Belgium, they are without exaggeration the beer Olympus. In order for a beer to receive the Authentic Trappist Product label from the International Trappist Association , it must be brewed (but not necessarily bottled)

Authentic Trappist Products logo
Source: *International Trappist Association, available online: <https:// www.trappist.be/ media/ 1221/ logo-groot.jpg>* [April 15, 2019].

in the premises of a Trappist monastery on a facility owned by the monastery by the Trappist monks, or at least under their supervision, and the majority of the profit from beer production must go to charity. In 2018, there were a total of twelve Trappist breweries in the world, six of which were in Belgium, evenly distributed in Flanders and Wallonia. These are the breweries Orval, Rochefort and Chimay (Wallonia), Westvleteren, Achel and Westmalle (Flemishes). Many of them are now managed as ordinary commercial companies, but these companies continue to maintain the quality of their beer at a very high level. Chimay, Orval and Westmalle can be considered commercial, Rochefort is semi-commercial, and Achel and especially Westvleteren can be considered non-commercial . Achel Monastery is no longer permanently inhabited by monks and in its own way falls under the Westmalle Monastery, but beer is still produced in Achel in smaller quantities. Since the late 1970s, the Chimay brewery has been bottling its beer several kilometers from the monastery so that the noise accompanying the bottling does not disturb the monks. Other Trappist breweries are located in the Netherlands, namely La Trappe and Zundert. Zundert is a small Trappist brewery with a short history and the beer is also bottled elsewhere. La Trappe can be considered the most commercial Trappist brewery in the world, the only one that routinely allows excursions to the brewery. At the beginning of the new millennium, the International Trappist Association even took away its Authentic Trappist Product label because the monastery had partially sold its brewing facilities to a private company in Bavaria . There is a Trappist brewery in Austria called Stift Engelszell, in Italy Tre Fontane, in the United States Spencer and finally in the United Kingdom Tynt Meadow, which started brewing beer in 2018. The French Trappist monastery Mont des Cats should also be mentioned, however, it does not have its own brewing technology and has a license to brew beer in Chimay. According to the regulations, the beer cannot be labeled as an Authentic Trappist Product.

The oldest Trappist brewery is said to be the Rochefort brewery founded in 1595,[178] which, like many others, was destroyed during the French Revolution and rebuilt more than a century later. Trappist beers only began to gain popularity after World War II, when Brother Theodore became the brewer at the Chimay brewery.

178 Belgian Happiness, Abbaye Notre Dame de Saint-Rémy – Rochefort Beer, available online: <https:// www.belgianhappiness.com/en/more-info/belgian-breweries/abbaye-notre-dame- -saint-remy-rochefort-beer> [15. 9. 2018].

The grave of Theodor de Haene
Photo: *Author's archive*

de Haene (1913–2002), who studied brewing at the University of Leuven under the distinguished expert Jean De Clerk.179 Brother Theodore isolated the yeast culture , but above all he greatly popularized Trappist beers, thus in a way opening this segment to a wider public. The share of Trappist beers in Belgium in 2011 was 12.9%.180

From the point of view of craft breweries and microbreweries, Belgium must be considered a very specific country with its own development, and right after the United States, the Belgian beer market can be considered the second most diverse in the world, although both countries have undergone diametrically different developments. While in the United States of America there has been a complete unification of production, Belgium, although it was slightly ahead of it , has always maintained its distinctive beer diversity. Perhaps the temporary extinction of the *witbier* beer style can be considered a short-term victory of globalization, or rather the process of market unification.

In 2007, twelve traditional Belgian breweries founded an association called Belgian Family Breweries. Its aim is to protect the tradition and quality of the products of traditional Belgian breweries that have been producing beer for more than 50 years. Only beer produced in an independent Belgian brewery can bear the logo of this association , and it must not be a licensed production of another non-original brand. In 2018

179 WALLACE, Caroline - WOOD, Sarah - DEAHL, Jessica, *Trappist Beer Travels,* Atglen 2017, p. 95.
180 POELMANS, E. - SWINNEN, J., *Belgium: Craft Beer Nation?,* cd, p. 146.

MOUNTAINEER
Source: *Horal, available online: <https:// www.horal.be/ sites/ default/ themes/ sycro/ logo/ logo.png>* [15. 4. 2019].

"Certified Belgian Monastery Beer" logo
Source: *Mémobières, available online: <https:// memobieres.files.wordpress.com/ 2014/10/ bic3a8re-belge-dabbaye-reconnue.png>* [15. 4. 2019].

21 breweries with a total of 160 brands were members of the association. The breweries thus associated represent together 15% of Belgian beer production.181

Another important Belgian brewing association is the High Council for Lambic Crafts (French: Haut conseil pour lambiques artisanales, Dutch: De Hoge Raad voor Ambachtelijke Lambiekbieren, HORAL), which brings together Belgian producers of spontaneously fermented beers and had a total of 15 members in 2018.182

In Belgium, there is a protected designation Certified Belgian Abbey Beer (Bière belge d'Abbaye reconnue), which has been awarded since 1999 by the Belgian Brewers Association.183 **The** designation can be obtained by beers that have some historical connection to a monastery, most often it is an originally monastic brand of beer, which is now produced under license somewhere else, often in a larger brewery belonging to a multinational company.

The designation covers about 25 brands, and only two of them are still produced in the brewery located in the original monastery building, the Cistercian monasteries of Val Dieu and Aulne. However, in the latter case, the classification is somewhat problematic . The monastery was abolished during the French Revolution and a smaller brewery was built on its ruins in 1998. Moreover, beer is brewed here quite exceptionally, it is usually produced in another brewery. During a regular tour, even a lay visitor will notice that the facility is not used very often. The Val Dieu monastery is the only Belgian non-Trappist monastery in which beer is produced all year round.

In 2016, Belgium had 19.57 breweries per million inhabitants.

181 Belgian Family Brewers, About BFB, available online: <https://belgianfamilybrewers.be/about/> [23. 10. 2018].
182 HORAL, Membres, available online: <https://www.horal.be/fr/membres> [24. 10. 2018].
183 Belgian Brewers, Certified Belgian Abbey Beer, available online: <http://www.belgianbrewers.be/en/beer-culture/the-art-of-beer/article/collective-marks> [24. 10/2018].

The oldest continuously producing brewery in the world – Weihenstephan in Freising, Bavaria
Photo: *Author's archive*

5.6 GERMANY

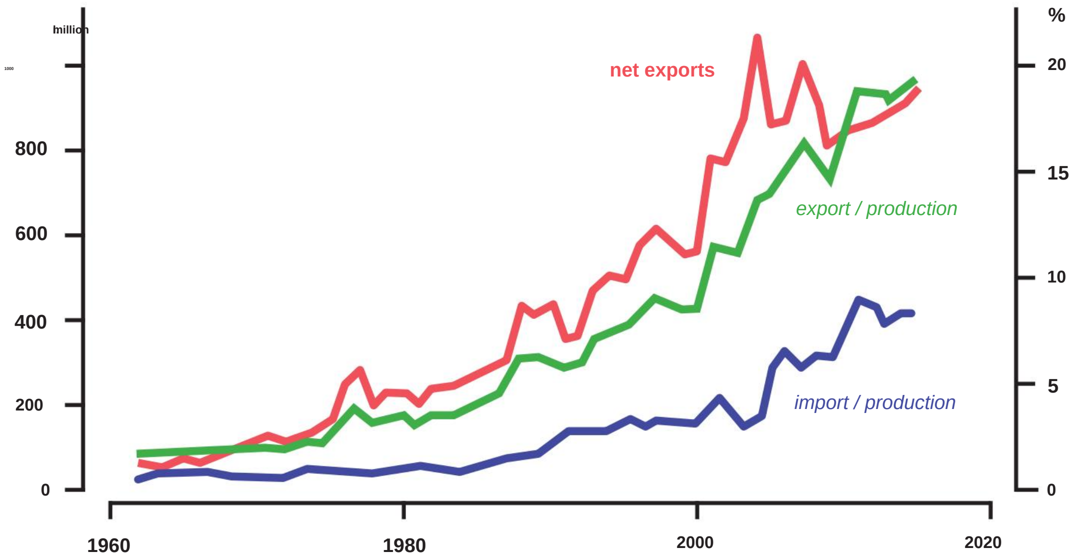
The German beer market is also very specific and is again strongly influenced by history, especially the centuries-long fragmentation of Germany, which was only ended by Bismarck in 1871. From a regional perspective, the German beer market can be considered the most diverse in the world, as regions retain their beer specificities to a greater or lesser extent. The dominant beer region is undoubtedly Bavaria.

In Bavaria, probably the most historically significant and famous beer law, the Reinheitsgebot, was enacted in 1516. However, it is also surrounded by many myths and half-truths, even in professional circles. The biggest nonsense is the claim that it is the first consumer protection law. This law is actually a local extension of the scope of a similar law that has been in force only in Munich since 1487.

In its original form, the Reinheitsgebot only allowed barley, hops and water to be used in beer production184 (yeast was only added to the law in the 19th century after its discovery) and its primary aim was certainly not to protect consumers. The aim was mainly to save other cereals – wheat and rye – for the bakery sector. The law can therefore be primarily considered as a nutritional law, preventing hunger or famine. It was certainly not a law that would significantly support brewing, except perhaps for the fact that it was forbidden to add any substitutes to beer. It was therefore aimed at combating the cheating of raw materials and, among other things, regulated the profits of innkeepers to a limited extent. According to some researchers, the reason could have been protectionism

184 EDEN, Karl J., *History of German Brewing,* Zymurgy, 1993, 14, 4.

Chart No. 21: Development of the German beer trade



Source: *UN Comtrade*

German states, especially against the Hanseatic League, which was already weakening at that time. In the northern parts of Germany, other ingredients were traditionally added to beer.185

The law was amended countless times, for example, from the mid-16th century it allowed some spices, but mainly wheat, as ingredients.186 It played a significant political role during the unification of Germany in 1871, because the then Kingdom of Bavaria insisted that its jurisdiction should be extended to the entire country after the unification of Germany. A compromise was reached – in the northern regions of Germany, any other ingredients used in beer production were taxed from 1873.187 In 1987, the European Court of Justice ruled that the law was protectionist and incompatible with the rules of the single European market, and so it was only applied to beer production in Germany.188 It can no longer be called a law, as its application by producers, or rather by commercial articles, is only voluntary. Producers do not have to comply with its rules,

185 BARLÖSIUS, Eva, *Soziologie des Essens: eine sozial- und kulturwissenschaftliche Einführung in die Ernährungsforschung,* Weinheim/München 1999, p. 213.

186 HACKEL-STEHR, Karin, *Das Brauwesen in Bayernvom 14. bis 16. Jahrhundert, in particular die Entstehung und Entwicklung des Reinheitsgebotes 1516,* dissertation, Berlin: Techn. Univ. 1987, p. 205–206.

187 OLIVER, G., *The Oxford Companion ,* c. d, s. 693.

188 Van TONGEREN, Frank, *Standards and International Trade Integration: A Historical Review of the German "Reinheitsgebot",* in: SWINNEN, Johan FM (edd.), The Economics of Beer, Oxford 2011, p. 54.

but then they may not label their product as beer produced in accordance with these "purity" rules.

Due to the above restrictions, the German beer market continues to be somewhat closed and conservative. Various spices, fruits, etc. are added to beer in infinitely smaller quantities than in other countries. Chart 21 shows that after the European Court's ruling, beer imports increased; until then, the share of imports in relation to production was less than one percent. Later, this value exceeded 8%. For comparison: in the Czech Republic, the share of imports in relation to production was approximately 1.5% in 2017.

The result of a certain closedness of the German beer market, however, is not its unification; on the contrary, in Germany one can come across many distinctive beer styles, the most important of which include:

ÿ *Weissbier (Wheat beer),*
ÿ *Smoked beer,*
ÿ *Kölsch,*
ÿ *Dortmunder,*
ÿ *Berliner Weisse,*
ÿ *Alt,*
ÿ different types *of lagers.*

Weissbier means white beer, *Weizenbier* means wheat beer, and most authors consider these words to be synonyms. Some authors distinguish beers according to the proportion of wheat malt used. However, for the purposes of this monograph, both terms will be considered synonymous. According to German rules, wheat beer can be called a beer that has been produced using at least 50% wheat malt.189 Breweries often add more wheat malt, however, with a higher content, technological problems arise during straining, because wheat, unlike barley, does not have hulls. Just for comparison: the Czech legal system does not recognize the term "wheat beer" at all (Decree No. 248/2018 Coll.).

Wheat has been used for the production of beer, or fermented grain beverages, since time immemorial. Some researchers believe that modern wheat beer originated sometime around the 12th or 13th century in Bohemia and subsequently spread through the Bavarian Forest to Bavaria. The Bavarian Duke Maximilian I even established a monopoly on the production of wheat beer in 1602, when only Bavarian dukes could produce it.190 Some relaxation came only in 1798, when several monasteries were granted permission to brew this beer. In the 19th century, wheat beer gradually lost its popularity and, similarly to many other countries, *lager began to replace it.* In 1872, the rights to produce

189 OLIVER, G., *The Oxford Companion,* c. d, s. 829.
190 Beer & Brewing, The Oxford Companion to Beer: definition of weissbier, available online: <https://beerandbrewing.com/dictionary/84fU3qNtk5/weissbier/> [10. 9. 2018].

***Kristall* wheat beer from a Bavarian brewery Schneider**

Source: *Schneider Brewery*

This beer was produced by Georg [191] and to this day the Schneider brewery is known for its production of wheat beer. Schneider I , a German beer maker, and is still a family-run brewery. In 1960, the share of wheat beer in Bavarian production reached **3%.192** This was followed by a renaissance of this beer style; there is also a certain parallel with the renaissance of the Belgian *witbier* style (see above). *Weizenbier* is exceptionally filtered, the filtered version is then called *Kristall.*

Smoked beer *(Rauchbier)* can be largely called an archaic beer. It was widely produced at a time when hot air was not yet used to dry malt, but smoke, which gave the malt a smoky flavor and this flavor was then transferred to the resulting beer. Smoked beer can be basically any beer style in which smoked malt is used. However, smoked malt is most often used to produce some types of *lagers* or wheat beers, and it is also found exceptionally *in porters.* In Bavaria, the least well-known area for the production of smoked beer is Upper Franconia, with the most in Bamberg and its surroundings. At the same time, this area can boast the highest density of breweries in the world. In 2015, there were 167 breweries in Upper Franconia. In terms of area, Upper Franconia is approximately the same as the South Moravian Region, which had only about a quarter of the number of breweries in the same year.

Kölsch is a top-fermented beer, with a taste that ranges between a pale *lager and* a stout. and a light wheat beer of the Bavarian type. A certain amount of wheat malt is used in the production *of Kölsch ,* although significantly less than in wheat beer. This beer was first brewed in 1892 in Domagen,193 and in 2008 it received the EU Protected Designation of Origin.

191 The Schneider brewery is still the leading producer of wheat beer in Bavaria and is still in the market. The Schneider family's jetty, owned by Georg Schneider VI since 2000.

192 OLIVER, G., *The Oxford Companion,* c. d, s. 830.

193 OLŠOVSKÁ, J. – ÿEJKA, P. – ŠTÿRBA, P. – SLABÝ, M., *Sensory analysis,* cd, p. 120.

In Germany's most important hop-growing region, Hallertau, you can visit the hop museum in the village of Wolnzach.
Photo: *Author's archive*

Dortmunder is a bottom-fermented beer that developed during the 19th century. The basis is the local, sulphate-rich Dortmund water.194 The beer was first produced in 1843 by the Dortmund brewer Heinrich Wenker, who was inspired by Bavarian bottom-fermented beers. The massive rise *of Dortmunder* was connected with the industrialisation of the Ruhr area. *Dortmunder* is usually fuller than Czech *lagers,* less hopped and tends to be smoother. This beer was often transported over long distances, so it came to be called *Export,* which is now synonymous with the term *Dortmunder.*

The most extreme German beer in terms of taste is probably the *Berliner Weisse* style , or *Berlin white.* The beer contains 35–50% wheat malt195 and has very little bitterness, around 5 IBU units. Interestingly, the hops are added directly to the mash.196 It is a top-fermented beer, with a certain amount of lactobacilli present during fermentation, which causes lactic acidosis, which makes the beer quite sour and is often flavoured with fruit or fruit syrups. The beer is very light, with an alcohol content of around 3%. The typical area for production used to be Berlin and the surrounding area, but today this style is experiencing a certain renaissance, thanks to the boom in cra

The Alt beer style has not been established for a long time, and even today the term is used for light, strong bottom-fermented beers. In the narrower and correct sense of the word, *Alt* is essentially a copper-colored, top-fermented beer, which is close to Belgian and original English ales , but ferments at lower temperatures than is usual.

194 KATSIGRIS, Costas - THOMAS, Chris, *The Bar and Beverage Book,* Hoboken 2007, p. 327.
195 OLŠOVSKÁ, J. – ÿEJKA, P. – ŠTÿRBA, P. – SLABÝ, M., *Sensory analysis,* cd, p. 117.
196 Cattle then, rather curiously, spit out the remains of hops when consuming the mash.

Table 22: Selected indicators of the German (mini)brewery sector for 2017

		Production				
	Number of	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Baden-Württemberg	204	**5,353**	28.0	0.52	181.0	3.38
Bavaria	642	**23,777**	–	–	906.7	3.81
Berlin/Brandenburg	67	**3,873**	12.6	0.32	22.7	0.59
Hesse	80	**1,885**	14.0	0.74	22.6	1.20
Mecklenburg-Western Pomerania	23	**3,318**	–	–	5.7	0.17
Lower Saxony/Bremen	82	**7,714**	15.7	0.2	26.8	0.35
North Westphalia	140	**19,110**	19.5	0.1	34.9	0.18
Rhineland-Palatinate/Saarland	76	**5,372**	14.4	0.27	25.1	0.47
Saxony	69	**8,526**	11.6	0.14	52.7	0.62
Saxony-Anhalt	25	**2,059**	5.6	0.27	5.6	0.27
Schleswig-Holstein/Hamburg	41	**2,005**	6.1	0.31	19.1	0.95
Thuringia	43	**2,436**	5.6	0.23	5.7	0.23
Germany	**1,492**	**85,428**	**21.1**	**0.26**	**1,308.8**	**1.53**

Source: *Statistisches Bundesamt, Brauwirtschaft*

in top-fermented beers, which is why it is subsequently left to ferment for longer. Cold hopping is generally not used and the aroma tends to be cleaner and not as fruity as in the case of the *ale* -type beers mentioned above, which is due to the lower fermentation temperature. The beer has the usual degree of bitterness like *lagers,*[197] but tends to be bitterer, reaching a bitterness of 30 to 50 IBU units.

Due to its size, Germany is full of regional differences in the brewing sector that no other country shows. The differences are also due to the division of Germany during the Cold War, when in East Germany the centrally planned economy led to the maximum concentration of brewing production, while West Germany, on the other hand, moved ahead economically rapidly through natural market development. In 1961 Bavaria had 160 breweries per million inhabitants, while Schleswig-Holstein and Hamburg had only 3.6 breweries per million inhabitants.[198]

197 JACKSON, M., *Encyclopedia of Beer,* cd, p. 71.

198 DEPENBUSCH, Lutz – EHRICH, Malte – PFIZENMAIER, Uwe, *Craft Beer in Germany. New Entries in a Challenging Beer Market,* in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, Cham 2018., p. 185.

Thanks to high-quality German statistics, it is possible to analyze the brewing markets in more detail for individual federal states. However, statistics are not available for all sixteen federal states; Berlin is taken together with Brandenburg, Bremen together with Lower Saxony, Hamburg together with Schleswig-Holstein and Rhineland-Palatinate together with Saarland, which is a fairly logical division for statistics.

Table 22 shows beer sales in individual federal states (respectively associations of federal states). The size groups of annual production up to 1,000 hl and up to 10,000 hl (including the category up to 1,000 hl) per year are separately allocated. A mini- brewery with a production of up to 1,000 hl per year is a typical restaurant microbrewery that has been established recently, as a brewery without its own restaurant would not be able to survive economically. Production units up to 1,000 hl can be called restaurant microbreweries and production units up to 10,000 hl microbreweries.

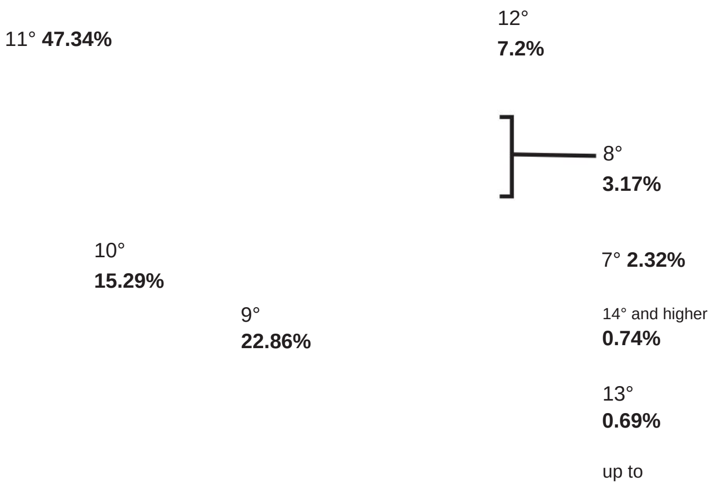
In Germany as a whole, microbreweries account for 1.53% of sales, which is roughly half a percentage point less than in the Czech Republic. However, there is no doubt that the share of restaurant microbreweries is significantly lower in Germany. From a regional perspective, Bavaria clearly leads in Germany with a share of microbreweries of 3.81%, However, restaurant microbreweries are completely absent here. This can be explained by the fact that successful microbreweries are continuously surviving on the market in Bavaria, so there is actually no room for new restaurant microbreweries to enter the sector. Statistics on the distribution of the number of breweries by size are only available for the whole of Germany, not for individual federal states.

It is no coincidence that Saxony-Anhalt and Thuringia have the same proportion of microbreweries and restaurant microbreweries, as both regions are new federal states of the former East Germany, where smaller breweries fell victim to the centrally planned economy. As a result, a number of microbreweries have recently been established there, and there has been a great demand for them.

Thanks to detailed data, it is also possible to calculate beer consumption per capita in individual federal states or regions. Saxony has the highest consumption with 209 liters , followed by Mecklenburg-Western Pomerania with 206 liters and Bavaria with 190 liters, which is quite surprising because Bavaria has long been considered the region with the highest beer consumption per capita.

It is also possible to compare the strength of beer in Germany and the Czech Republic, although the comparison is not entirely accurate due to the available data, it can rather be taken as an indication. For the Czech side, the data given here are domestic consumption data without imports from non-EU countries, for the German side, these are production data for the whole of Germany . The differences are striking, the similarity lies only in the fact that in both countries, eleven-proof beers have the most significant share, in the Czech Republic it is 47%, in Germany it is an incredible 71%. In Germany, beers weaker than elevens are not very popular, their share is less than 8%, while the Czechs drink ten-proof beers at around 15%.

Graph No. 22: Beer consumption in the Czech Republic by grade, excluding imports from outside the EU (2017) in%

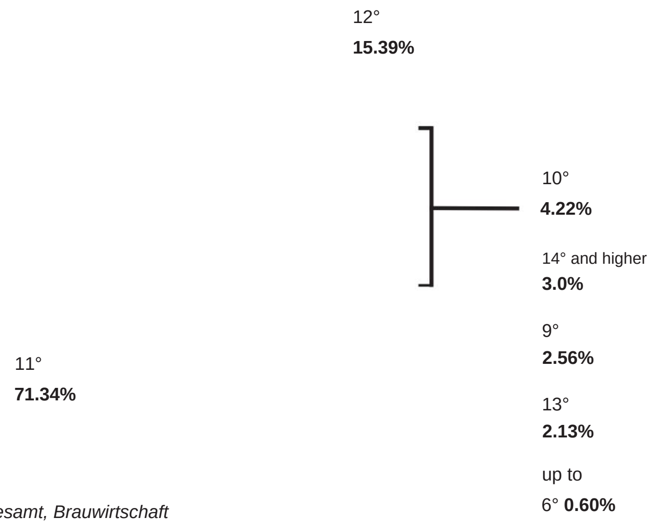


Source: *Customs Administration of the Czech Republic*

and nines even almost 23%. The so-called high consumption of nines is mainly due to the relatively unfortunate labeling of beer in the Czech Republic, where the majority of consumers believe that draft beer and ten are synonyms. However, what the Czech consumer considers to be tens are actually nines due to excise tax. In recent years, there has been a change in the Czech Republic, with consumers shifting from draft beers to lagers. Germans also drink more than twice as many beers. Then the situation is somewhat similar, but in terms of quantity it is a marginal market segment. Germans in 14s and stronger beers have a share of consumption of 4.22%, Czechs 3.17%, the difference is due to the popularity of strong beers such as *bock* in Germany, especially in Bavaria.

Germany generally shows a low degree of concentration in the brewing industry. Adams (2011) reports that while the market share of the four largest companies in the USA increased from 25% to 95% between 1950 and 2000, in Germany it increased from 12% to 29%. The reason is the strong local patriotism of German consumers. In contrast to the United States, Germany has preserved (maintained) more distinctive beer styles, product heterogeneity, and the traditional connection between consumers and their local breweries. This is most striking in Bavaria, where customers still prefer local brands, not multinational and global brands. Therefore, the boom in microbreweries and craft breweries in Bavaria was not as significant as in the

Chart No. 23: Beer production in Germany by degree in%



Source: *Statistisches Bundesamt, Brauwirtschaft*

in countries where market concentration and product unification reached enormous values . In other words, in the second half of the 20th century, there was no such massive closure of breweries in Bavaria as in the USA or the Czech Republic, and the demand for new craft breweries and microbreweries was not and is not as great. In Bavaria, there is also less opportunity to differentiate from the competition.

The product heterogeneity of the German beer market is high. In 2015, the share of *pilsners* was 54%, wheat beers 7.6% , *and Export (Dortmunder)* reached 7.4%, *Kölsch* 1.6% *and Alt* 0.8%.199 The share of *pilsner* is even decreasing, from 69% in 1981 to just 49% in 2002.200

Similarly to the Czech Republic, the term craft breweries is not used much in Germany . The term microbrewery is more commonly understood as a restaurant microbrewery. Many authors, such as Alltech, define a microbrewery with a maximum annual production of 1,000 hl and list 717 such German breweries in 2015.201 Germany does not have a large number of microbreweries, and their numbers are comparable to those of Italy and France, although it has Germany has a much higher beer consumption per capita and is a traditional brewing country.

199 STROBL, Marcus, *Spezialbieresorgen für Bevegung,* Lebensmittel Zeitung, 2016, 19. Februar, p. 45.

200 ADAMS, William James, *Determinants of the concentration in beer markets in Germany and the United States: 1950–2005,* in: SWINNEN, Johan FM (edd.), The Economics of Beer, Oxford 2011, p. 234.

201 Alltech, How Many Craft Breweries are there in the World?, available online: <http://ag.alltech.com/en/blog/2015-craft-brewery-count> [18. 12. 2018].

Table 23: German brewing sector

Germany	2010	2011	2012	2013	2014	2015	2016
Production (thousands of hl)	95,683	95 545	94 618	94,365	95,274	95 623	94 957
Consumption (thousand hl)	87,872	87 655	86 279	85,888	86,512	86 018	85 532
Consumption (l/capita)	107	107	108	107	107	106	104
On-trade sales (%)	20	19	19	19	19	19	18
Off-trade sales (%)	80	81	81	81	81	81	82
Imports (thousands of hl)	–	7,694	7,279	6,306	6,783	6,697	7,287
Exports (million hl)	–	15,986	15,697	1 5091	15,627	15,949	16,527
Number of breweries	1,333	1,347	1,340	1,349	1,352	1,388	1,408
Number of microbreweries	646	659	666	673	682	723	738

Source: *Brewers of Europe*

A certain disadvantage for German craft breweries is the smaller possibility of further expansion. Germans are local patriots when it comes to beer, and in addition, in Germany it is normal for craft breweries to provide distribution themselves compared to, for example, the USA.

Regarding the latest trends, Germany is characterized by a slight decrease in beer consumption per capita and especially low beer sales in restaurants; in 2016, it was not even one in five beers, as can be seen from Table 23.

In 2016, Germany had 17.13 breweries per million inhabitants and 8.98 microbreweries per million inhabitants, which are rather below average values in developed European brewing countries .

5.7 JAPAN

Japan is certainly not a country with an exceptional brewing tradition, but the microbrewery boom has perhaps been even more intense there. Moreover, Japan is the seventh largest beer producer in the world, with an annual production volume of 51.610 million hl in 2017.202

ビール

Japanese beer [Bÿru]
Source: *Own processing*

After World War II, Japan was forced to unconditionally surrender, the country opened up to the world, and a variety of new alcoholic beverages arrived.203 **Up** until then, wine was not widely consumed in Japan; the traditional Japanese spirit called shochu was popular. It is most often made from rice or other grains and usually contains around 45% alcohol.

However, the tradition of Japanese brewing begins a little earlier, most often in the 19th century. The first person to test beer in Japan was a certain doctor, Koumin Kawamoto, in 1853. The oldest brewery in Japan was founded in 1870 by William Copeland (1834–1902), who came from Norway and whose original name was Johan Martinius Thoresen. He trained in a German brewery and also worked for some time in the dairy industry. He was a great follower of Louis Pasteur and after his invention of pasteurization, he began pasteurizing his beers. The company he founded (in 1869 or 1870) was called Spring Valley Brewery, but it went bankrupt in 1886 and was taken over by the Japan Brewing Company. In 1907, it was renamed Kirin Brewery Company,204 which in 2017 was number ten in the global beer market with a 1.5% share.205 However, Kirin beer began to be sold as early as 1888.206 Japan actually skipped the era of top-fermented beers altogether; in the second half of the 19th century, the developing brewing market there copied modern European trends, and thus mainly produced Czech or German *lagers* .

202 THE BARTH REPORT, Barth-Haas Group, available online: <https://www.barthhaasgroup.com/images/mediacenter/downloads/pdfs/412/barth-bericht20172018en.pdf> [15. 12. 2018].

203 NINOMIYA, Mari – OMURA, Makiko, *Government Regulations and Microbreweries in Japan,* in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, Cham: Palgrave Macmillan 2018, p. 425.

204 ALEXANDER, Jeffery, B., *Brewed in Japan: The Evolution of the Japanese Beer Industry,* Vancouver 2013, p. 21.

205 THE BARTH REPORT, Barth-Haas Group, available online: <https://www.barthhaasgroup.com/images/mediacenter/downloads/pdfs/412/barth-bericht20172018en.pdf> [15. 12. 2018].

206 The History of Kirin Pre-Kirin Brewery Years: Japan Brewery Company, Limited(1885-1900), available online: <https://www.kirinholdings.co.jp/english/company/history/group/01.html> [4. 10/2018].

William Copeland founded Japan's oldest brewery
Source: *Brookston Beer Bulletin, available online: <https:// c1.staticflickr.com/ 1/480/31862795790_034ebc803d_o.png>* [15. 4. 2019]

(Bavarian) type. The best known and most economically significant company today, not only in Japan but also globally, is Asahi, which was founded under a different name in 1889 in Osaka. In 2017, it had a 3% share of the global market and is thus the seventh largest brewing company in the world. It is very important for the Czech Republic , as in 2016 it purchased the Czech number one brewery, Plzeÿský Prazdroj. Japan is strongly tied to the Czech brewing market, with the largest exports of Czech hops going to Japan.

In 1901, an excise tax was introduced on beer, and seven years later, under pressure from existing companies who wanted to limit entry into the industry, a licensing system was introduced, and only breweries with a minimum annual production of 1,800 hl could produce beer. This standard was significantly tightened in 1940, when the limit was raised to 18,000 hl, effectively preventing new companies from entering the industry. In 1959, this value was increased to 20,000 hl, and the entire sector was thus largely preserved. The change did not occur until 1994, when the limit was lowered to 600 hl, and only then were the conditions established for the emergence of a number of microbreweries. In Japan, any production of alcoholic beverages above 1% alcohol is prohibited.

Japanese company Suntory bought American craft brewery Anchor Brewing in 2017
Source: *PNGKIT, available online: <https:// www.pngkit.com/ png/ detail/ 293-2938573_anchor-logo-anchor-brewing-company-logo.png>* [15. 4. 2019].

Chart No. 24: Shares of companies in the Japanese beer market (2014)

others
9%

Asahi **35%**

Sapporo **11.1%**

Suntory **15.4%**

Kirin **29.5%**

Source: *The Wall Street Journal, September 17, 2015*

in domestic conditions, which has a negative impact at least on the legalization of home-brewing (home beer production).

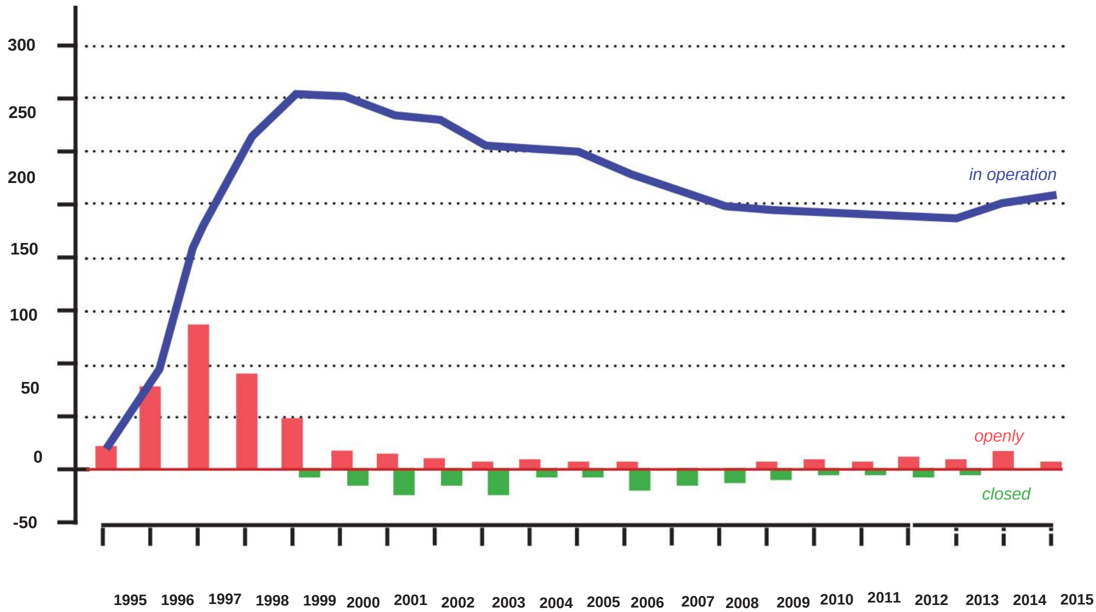
Chart 24 shows the shares of the Japanese beer market in 2014, which can be considered highly concentrated, which is a consequence of the licensing rules. Although these rules were greatly liberalized in 1994, the local brewing industry remains a sector with expensive investment to enter the industry, so the situation has not changed much since liberalization. The market is dominated by four companies, the so-called big four: Asahi, Kirin, Suntory and Sapporo. In 2014, they together controlled 91% of the market, only 9% was accounted for by to other companies and import.

Microbreweries thus began to develop successfully only after 1994. In the same year, the Japan Craft Beer Association was founded in June, with Ryouji Oda as its founder. As a result of liberalization, in 1998 there were already 310 microbreweries operating in Japan with a total production of 150,000 hl per year. For 2008, the production of Japanese microbreweries was reported at 290,000 hl, and in 2013 it was 350,000 hl.207

Since the Japanese craft beer market had nothing to build on, in the first ten years it showed one major difference from the brewing superpowers. Consumers were largely uneducated, brewers were also not very good, and so microbreweries produced almost exclusively bottom-fermented beers of poor quality. That is why the mortality rate of microbreweries was alarming, by 2015 a total of

207 Craft Beer Association, Craft Beer Market in Japan, available online: <http://beertaster.org/ index-e.html> [4. 10/2018].

Chart No. 25: Development of the number of microbreweries in Japan



Source: *Ninomiya, M. - OMURA, M.,* Government Regulations, *c. d., s. 435.*

394 microbreweries and 137 of them were closed by the same time,208 which in relative terms represents 35%. One of the basic prerequisites for the survival of a microbrewery is product differentiation,209 unfortunately, this strategy was not followed by Japanese microbreweries during the period. However, large companies have started to take microbreweries and craft breweries seriously, as both Asahi and Kirin operate their own microbreweries.210

Chart No. 25 clearly shows the development of the microbrewery sector in Japan. After liberalization in 1994, a period of massive opening of microbreweries began, which lasted only until 1999. In 2000, the number of closed microbreweries was higher than the number of newly opened microbreweries for the first time. The era after 2000 can be described as a period of stagnation for Japanese microbreweries.211 Change only came in 2015, when there was a slight revival and a variety of top-fermented beers finally began to fully establish themselves in Japan.

208 Kita Sangyo Co., Brewerz List, available online: <http://www.kitasangyo.com/BEER/beer_index.htm> [15. 3. 2015].

209 SWINNEN, Johan – VANDEMOORTELE, Thijs, *Trade and the Political Economy of Food Standards,* Journal of Agricultural Economics, 2011, 62, 2, p. 259–280.

210 CTV News, Changing tastes brew bitter times for Japan's beer makers, available online: <http://www.ctvnews.ca/lifestyle/changing-tastes-brew-bitter-times-for-japan-s-beer--makers-1.3548016> [6. 12/2017].

211 NINOMIYA, M. - OMURA, M., *Government Regulations,* cd, p. 442.

Ninomiya and Omura distinguish four ways (options) of establishing microbreweries in Japan:

1. establishment of a microbrewery by existing sake and wine producers,
2. establishment of a microbrewery and its subsidization by the local administration for regional development,
3. establishing a microbrewery and subsidizing it by companies outside the industry,
4. establishment of a microbrewery by independent entrepreneurs.212

The fourth method, however, only appeared later, because completely independent entrepreneurs did not have sufficient knowledge and know-how to operate microbreweries, as for many years there was a great shortage of at least minimally qualified personnel, which was a consequence of the previous conservation of the entire sector. The situation changed very slowly thanks to the fact that the workforce went to receive education in advanced brewing countries, especially the USA and Germany, but also the Czech Republic.

In the first phase, specifically in 1995, out of a total of twenty microbreweries, eleven were founded by existing sake and wine producers.213 Since 1975, the sake production sector began to decline, and so many existing producers saw the future in beer .

The local government established microbreweries in cooperation with private investors because it believed that it could support the local economy. These microbreweries were very strongly linked to tourism and 60% were of the restaurant type.

According to Beer Advocate, as of February 2018, there were 194 breweries in Japan, 214
1.33 breweries per million inhabitants.

5.8 ITALY

Czechs most often perceive Italy as the promised land of wine. Not that this is not true, but of the southern European countries, it is the country where the microbrewery boom took place with the greatest intensity. Italy is characterized by strong regional differences, which is a consequence – similarly to the case of Germany – of historically long-lasting fragmentation . Italy was only unified during the 19th century and strong regional differences, especially in the economic area, persist to this day. The north of Italy is economically much more successful than the south, so the boom in microbreweries affects the developed northern part of the country the most. Italy also has one European primacy, it can boast the highest (micro)brewery in Europe, which is located at an altitude of 1,816 meters above sea level in the famous ski resort of Livigno.

212 Ibid., pp. 434–435.
213 Ibid., p. 435.
214 Beer Syndicate, Data Chug: Analysis of The Most Popular Beer Styles in the World, available online: <http://www.beersyndicate.com/blog/data-chug-analysis-popular-beer-styles-world/2/> [15. 9. 2018].

The brewery in the Italian town of Livigno is the highest-altitude brewery in Europe
Source: *Ilcucchiaiod´argento*

Italy is not self-sufficient in beer (see Table 24), imports are greater than exports, which is understandable, since it is a typical wine-growing country. In the whole of developed (Western) Europe, beer consumption is rather decreasing, in the case of Italy we can speak of stagnation or even slight growth. As late as 1980, per capita consumption was 16.7 liters and production was at the level of 8.569 million hl. After more than thirty years, the situation is completely different, in the mentioned period the brewing sector in Italy has grown significantly and its structure has changed even more . The number of large breweries has decreased, in 1980 there were thirty, in 1990 twenty, and by 2012 there were only fourteen left. In the sector of microbreweries and craft breweries, the trend is completely opposite.

Table 24: Basic indicators of the Italian brewing industry

Italy	2010	2011	2012	2013	2014	2015	2016
Production (million hl)	12,814	13.41	13.293	13,256	13,521	14,286	14,515
Consumption (million hl)	17,249	17,715	17,458	17,544	17,755	18,914	18,873
Consumption per capita (l)	29	30	29	29	29	31	31
On-trade sales Off-	–	42	41	40	43	42	41
trade sales Imports	–	58	59	60	57	58	59
(thousand hl)	–	6,365	6,155	6,215	6,231	7,175	6,939
Exports (million hl)	–	2,095	1,990	1,892	2,145	2,547	2,581
Number of breweries	302	344	415	503	593	682	751
Number of microbreweries	294	336	407	491	505	540	718

Source: *Brewers of Europe*

The development of the Italian brewing industry after World War II shows significant similarities to other developed Western countries, with the market already being highly concentrated at the very beginning.

Thanks to mergers and acquisitions, the beer market has gradually come to be dominated by four companies – Peroni, Wuhrer, Luciani Group (Padavena-Dreher) and Birra Poretti. This is also related to growth in the average size of a brewery. In 1970 the average size was 156 thousand hl, ten years later it was 276 thousand hl and in 1990 it rose to 507 thousand hl.215 According to Table 25, the greatest concentration of the industry was recorded in 2000, when the four largest companies controlled over 97% of the market, but this value abstracts from imports, which are quite significant for Italy. In reality, these four companies had a smaller share of the Italian consumer market.

Table 25: Development of concentration on the Italian beer market (excluding imports)

	Sum of shares of the four largest companies (%)
1949–1950	61.78
1959–1960	66.34
1970	68.99
1980	68.00
1990	84.75
2000	97.38
2010	89.37

Source: *GARAVAGLIA, Christian,* The Birth and Diffusion of Craft Breweries in Italy, *in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, Cham 2018., p. 233*

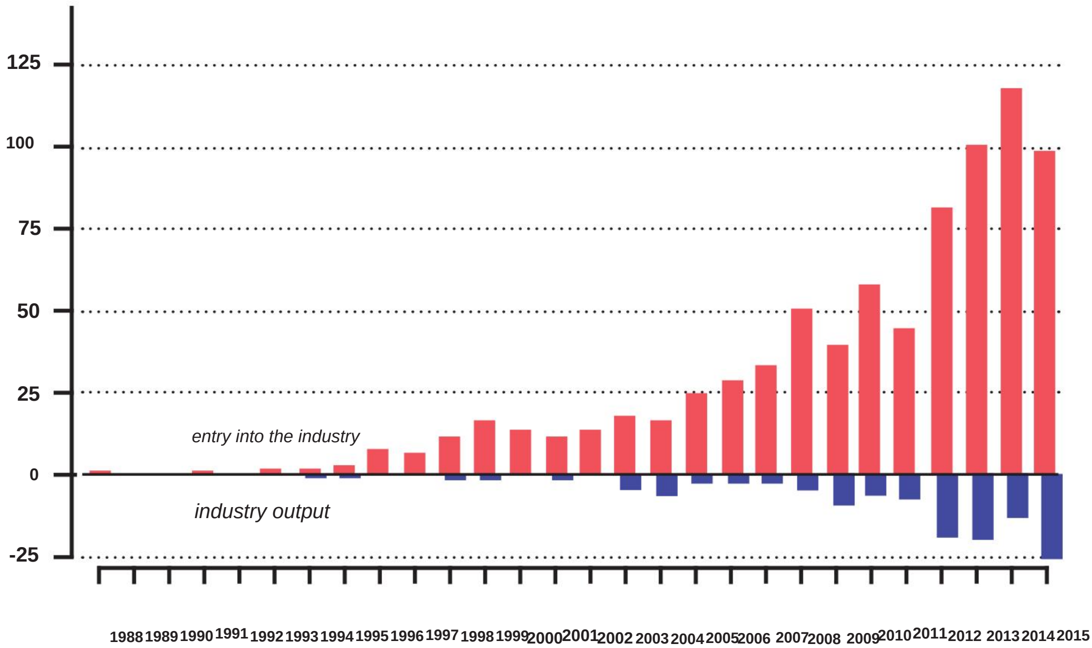
Until 1980, the concentration of the Italian market did not increase much, but everything changed after the multinational companies Carlsberg, Heineken and SABMiller entered the Italian market. In 1990, the share of Peroni was 37.6% and Heineken 30.36% (again, excluding imports), so the market could be considered very concentrated.

The first microbrewery, or restaurant microbrewery, was opened in Italy in 1988. The era of microbreweries gradually started, but so far it was only a vague premonition. The pioneering period began in 1988 and ended in 1994, or perhaps a year later. In 1988, Gianfranco Oradini and his brothers opened a multifunctional complex (Senso Unico) in the northern Italian town of Torbole on Lake Garda. The microbrewery was opened in cooperation with the Bavarian brewery Luitpold, which also supplied brewing technology and know-how. However, the microbrewery did not survive long. This step was unique until 1991, when Pepinello Eposito opened a second Italian microbrewery – Svatý Josef in Sorrento. The person in question also had ties to Germany, or rather Bavaria, where he had previously worked in brewing for several years.216

In 1997, an association of craft breweries was founded under the name Unionbir-rai, has been organizing its own craft beer tasting competition since 2005.

215 COLLI, Andrea, *The Italian Brewing Industry,* in: GOURVISH, Terry - WILSON, Richard G., The Dynamics of the Modern Brewing Industry Since 1880, London and New York 1998, p. 18–45.
216 NASINI, D., *St. Josef Biernata and Sorrento,* Il Mondodella Birra, 1991, 90, p. 42.

Chart 26: Number of breweries entering and exiting the sector in Italy (1984–2015)



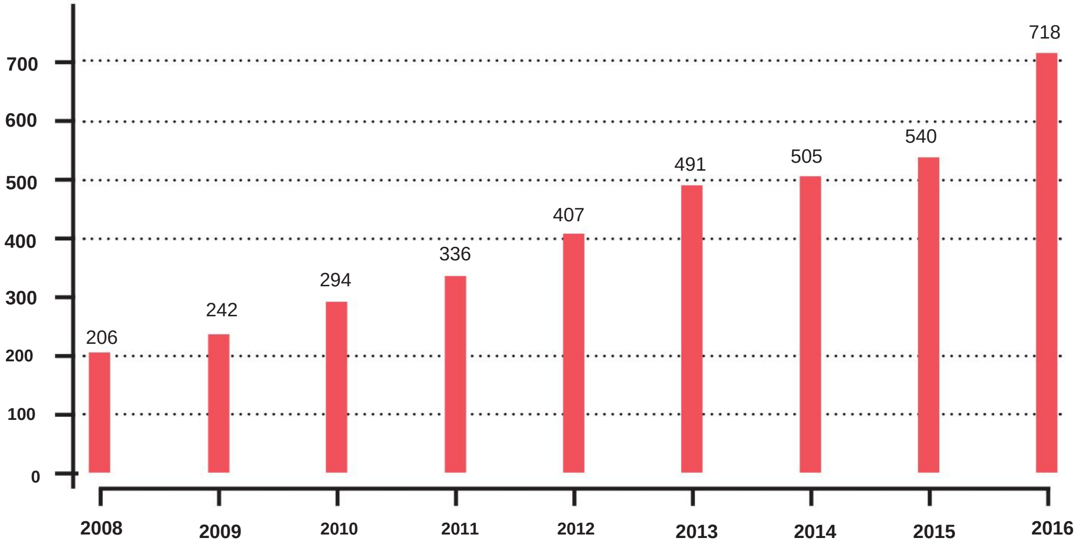
Source: *GARAVAGLIA, C.,* The Birth and Diffusion, *cd, p. 238.*

Logo of the Unionbirrai organization Source: *Craft Beer Italy, available online: <http:// www.craft-beer-italy.it/ wp-content/ uploads/ 2017/07/ UB-Logo-Colore-1- 1-e1507728702573.jpg>* [15. 4. 2019].

The Italian market was heavily inspired by German beer culture. In 1993, two more microbreweries entered the market. The first was Aramini Brauerei near Asti, opened by Renzo Aramini (Bearzatto, 1993). In the same year, Industrie Birre Speciali (IBR) was founded in Capoterra, opened by Adis Scopel.217 The oldest microbrewery that survived to 2018 is Mastro Birraio, opened by Bruno Ioan in 1994.218 It was again inspired by the foreign market, specifically Hungary, as the first brewer was Hungarian. The last microbrewery founded in this pioneering era was Brew Mood Ale House, founded by Modesto Bettone. The microbrewery also closed down.

217 GARAVAGLIA, C., *The Birth and Diffusion,* cd, p. 248.
218 Ibid., p. 248.

Chart 27: Number of microbreweries in the sector in Italy (2008-2016)



Source: *Statista, available online: <https:// www.statista.com/ statistics/ 447386/ italy-number-beer-breweries/* > [15. 4. 2019].

In the so-called pioneering period, local microbreweries, like everywhere else in the world, showed a significant mortality rate. The inexperience of these companies was to blame, as well as underdeveloped consumer demand. A group of consumers who would be willing to pay extra for a selection of beers had not been created. Of the five microbreweries founded in the aforementioned period, only one survived until 2018.

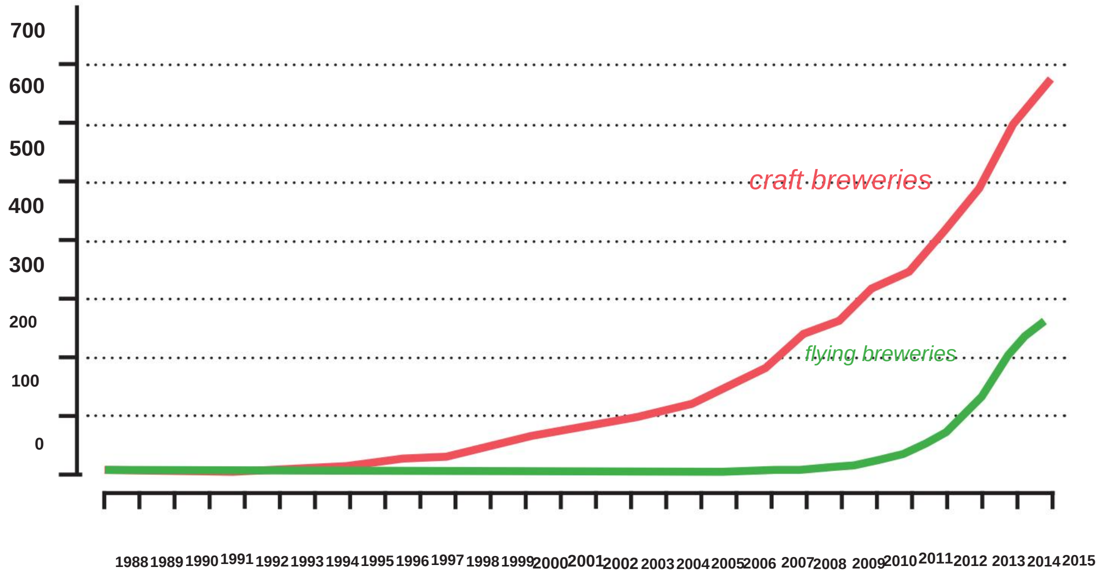
Graph No. 26 shows the number of microbreweries opened in individual years. At the end of the mentioned period, a number of microbreweries ceased their activities. The increase in the number of microbreweries is associated with the year 2014, when more than a hundred microbreweries began producing beer .

For 2016, statistics show a record 718 functional microbreweries in Italy, which represents a year-on-year increase of 178, or a third in relative terms. In Italy, microbreweries are spread out quite unevenly. By far the fewest are in southern continental Italy, even fewer than in Sicily. The largest number of microbreweries is located in Rome and its surroundings and in the very north of Italy, where there is a brewing tradition and strong German or Austrian influences are evident. The reasons are also economic; one of the prerequisites for the emergence of microbreweries is the high purchasing power of the population, and the north of Italy is significantly more economically developed than the south.

For a long time, flying breweries were a very insignificant market segment in Italy . Everything started to change with the arrival of the economic crisis in 2008. Since 2010, there has been an exponential increase in the number of flying breweries in Italy, according to graph no. 28 of them

Machine Translated by Google

Chart No. 28: Development of the number of craft and flying breweries in Italy



in 2015, there were 270 out of a total of 670, of which 152 were restaurant microbreweries . In 2015, the average size of a microbrewery was 620 hl and the market share of craft beers was 3.3%.219 The size of companies in the sector is highly variable, with production fluctuating from 20 hl to 20,000 hl.220 More than 40% of craft breweries also have no employees, meaning that the owners handle production, distribution and administration themselves.

The Italian brewing industry has not given the world any famous beer style, but in 2015 the Beer Judge Certification Program recognized the beer style *"Italian grape ale".* This is a modern beer style that would not have existed without the development of Italian microbreweries . Its production is not specified in any detail. It is reported that it can contain up to 40% grapes in the pour and can be fermented with *ale* yeast or wine yeast.221 **Italy** does not deny significant influences from the wine sector in the brewing sector eithe

In 2016, there were 11.87 microbreweries and 12.41 total breweries per million inhabitants in Italy.

~~**219** ALTIS, Osservatorio ALTIS~~ – UNIONBIRRAI sul segmento della birra artigianale in Italia, available online: <https://altis.unicatt.it/altis-Altis_UB_2015.pdf> [15. 9. 2018].
220 GARAVAGLIA, Ch., *The Birth and Diffusion,* cd, p. 239.
221 Beer Judge Certification Program, 2015 Style Guidelines, available online: <https://www.bjcp.org/docs/2015_Guidelines_Beer.pdf> [9. 10/2018].

5.9 SWITZERLAND

The great development of microbreweries in Switzerland is due both to the country's brewing tradition and to the high purchasing power of the population, who are willing to pay extra for special beers and beer styles.

The history of Swiss brewing dates back to the founding of the monastery in St. Gallen (St. Havel). The oldest mention of beer brewing in Switzerland dates back to 754. It is said that it later became the first truly large-scale brewery in Europe, employing a hundred monks and apprentices. In 1890, 500 breweries were recorded in Switzerland. The Swiss beer market suffered from great protectionism throughout the 20th century (there was a brewing cartel). After World War II, however, the entire system was gradually relaxed and in 1960, after a long period of time, a new brewery was founded – the Boxer brewery.222 The cartel finally collapsed in 1991 and imports subsequently increased very quickly from 1% of local consumption to many times higher values . Most beer imported to Switzerland comes from Germany.223 Multinational companies were also quick to acquire Swiss companies. By the end of the 1980s, Carlsberg and Heineken controlled two-thirds of the market there. It was only after the collapse of the cartel in 1991 that the conditions were ripe for the massive emergence of microbreweries and craft breweries.

Swiss brewing is very strict and conservative in the beer production process. Only hops and no aromatic additives such as fruit may be used.224

In Switzerland, there is no tax advantage for smaller breweries within the excise taxes. Beer is taxed according to a graduated scale in three categories:

1. up to 10% Plato,
2. from 10.1% Plato to 14% Plato,
3. more than 14.1% Plato.225

For one half-liter of 12-ounce beer, you pay CZK 2.87 **226 in excise tax,** which is only about a crown more than in the Czech Republic.

Unfortunately, older and more accurate data for the Swiss brewing sector are not available , making it very difficult to reconstruct recent history. For 1990, there were 32 operational breweries, the lowest number ever, due to the cartel.227

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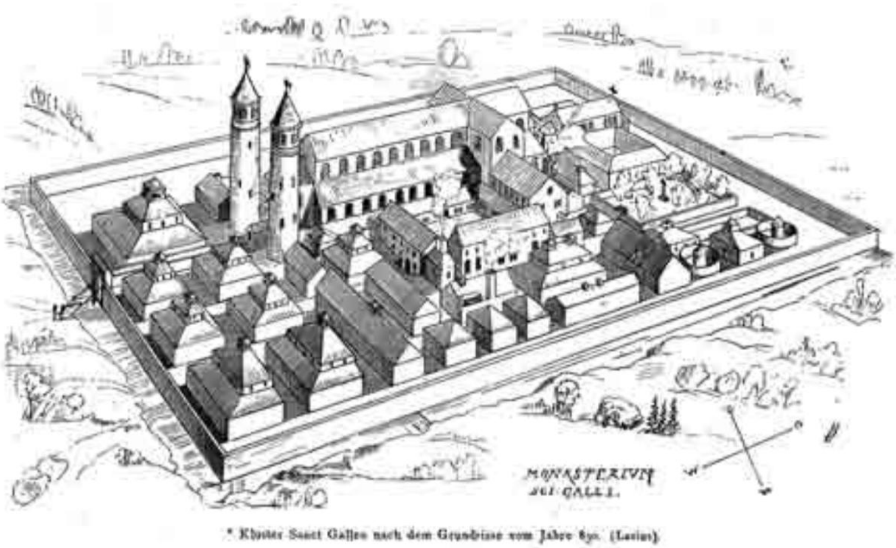
222 Doppelleu Boxer, History, available online: <http://www.boxer.ch/cms/index.php/en/la-societe-uk/historique-uk> [9. 10. 2018].
223 Beer & Brewing, The Oxford Companion to Beer definition of Switzerland, available online: <https://beerandbrewing.com/dictionary/2qpHjS8iNJ/switzerland/> [9. 10/2018].
224 Matterhorn Chalets, The Story of Beer in Switzerland (and Zermatt's newbrew!), available online: <https://www.matterhornchalets.com/2015/08/23/beer-in-switzerland/> [9. 10/2018].
225 Eidgenössische Zollverwaltung, Swiss Federal Customs Administration, available online: <https://www.ezv.admin.ch/ezv/de/home/information-firmen/steuern-und-abgaben/einfuhr-in-die--schweiz/alkoholabgaben-und-veg/biersteuer.html> [15. 9. 2018].
226 Converted at the exchange rate from October 9, 2018.
227 The Local, Record numbers join Swiss craft beer boom, available online: <https://www.thelo-cal.ch/20160303/record-numbers-join-swiss-craft-beer-boom> [10. 10/2018].



The monastery of St. Gallen may have looked similar in 830.
Source: *Wikipedia Commons, available online: <https:// upload.wikimedia.org/ wikipedia/ commons/ 5/58/ Rahn_Kloster_Sanct_Gallen_nach_Lasius.jpg>* [15. 4. 2019].

Wädi-Brau-Huus Brewery
Source: *Wädi-Brau-Huus, available online: <https:// www.waedenswiler.ch/ index.php/ archiv. html?file=files/ brau/ medien/ prospekte/ Bier%26Brezel_NR-5_M%C3%A4rz%202017.pdf>* [15. 4. 2019].

The website ratebeer.com lists the oldest functioning Swiss restaurant brewery as Wädi-Brau-Huus, which opened in 1991.

Table No. 26: Basic indicators of the Swiss brewing industry

Switzerland	2010	2011	2012	2013	2014	2015	2016
Production (million hl)	3,539	3,546	3,515	3,370	3,432	3,438	3,422
Consumption (million hl)	4,526	4,626	4,623	4,595	4,657	4,624	4,605
Consumption per capita (l)	57	58	57	56	56	55	55
On-trade sales	–	50	50	47	46	44	40
Off-trade sales	–	50	50	53	54	56	60
Import (hl)	–	1,080,000	1,108,000	1,225,000	1,225,000	1,186,000	1,183,000
Export (hl)	–	79,000	80,000	53,000	63,000	60,000	79,000
Number of breweries	328	360	375	409	483	623	753
Number of microbreweries	280	313	328	363	440	573	703

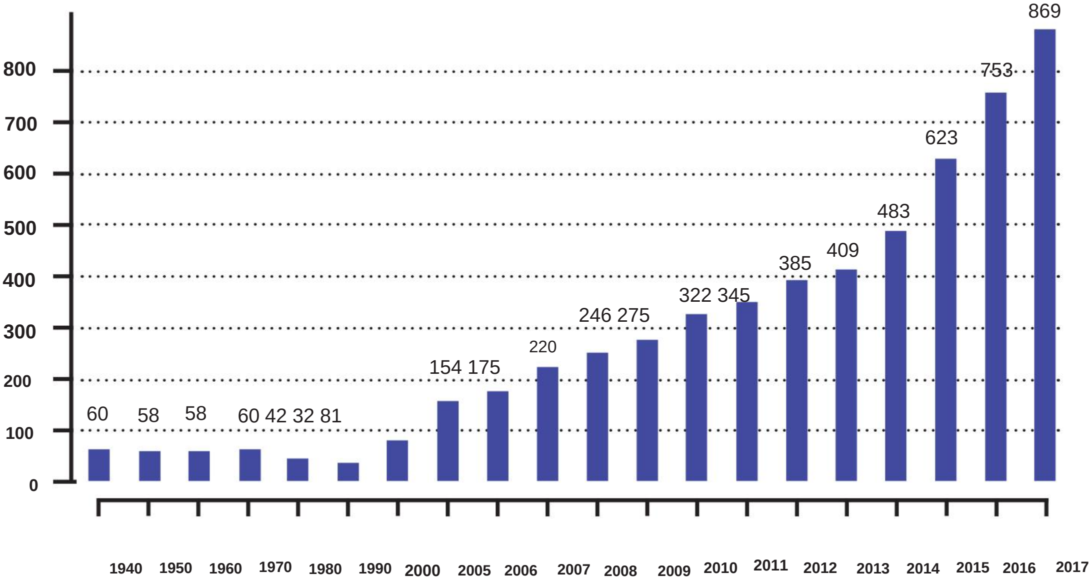
Source: *Brewers of Europe*

The Swiss and Czech beer markets have one analogy. Between 2010 and 2011, beer sales in the on-trade channel (sales in restaurants, bars, etc.) fell from 50% to 40%, which almost exactly copies the development in the Czech Republic, while per capita consumption stagnated or slightly decreased, similar to the Czech Republic. Table 26 shows a completely marginal export compared to production, while the Czech Republic exported about 22% of beer production in 2016, while for Switzerland it was about 2.3%. The reason was undoubtedly the price uncompetitiveness of the Swiss brewing industry. Switzerland is a country with very high production costs, and products with high added value, which do not include beer, are the most popular here. On the contrary, beer imports accounted for about a quarter of Swiss consumption of this beverage in the year in question. In the case of Switzerland, the observed values are completely opposite compared to the Czech Republic. The Czech border is extremely impermeable to beer inward, while the S

However, Table 26 has one major shortcoming, namely the number of breweries and the number of microbreweries. Swiss statistics use a different methodology and include homebrewing in the group of microbreweries. In October 2018, the ratebeer.com server recorded a total of 514 breweries in Switzerland, of which 44 were listed as client-owned, i.e. flying breweries. Private brands of large retail chains are also considered flying breweries . The Craft Beer in Europe study lists 419 breweries in Switzerland as of 2016.228

228 Bord Bia, Craft Beer in Europe, available online: <https://www.bordbia.ie/industry/events/SpeakerPresentations/2017/CraftBeerBriefing2017/The%20Emergence%20of%20Craft%20Beer%20in%20Europe%20-%20Zenith%20Global.pdf> [9. 10/2018].

Chart No. 29: Development of the number of breweries in Switzerland



Source: *Swiss Federal Customs Administration*

Graph 29 shows the development of the number of breweries in Switzerland, or rather the number of entities registered with the Federal Customs Administration for excise duty. This also includes homebrewers, whose emergence can be seen massively in the last twenty years.

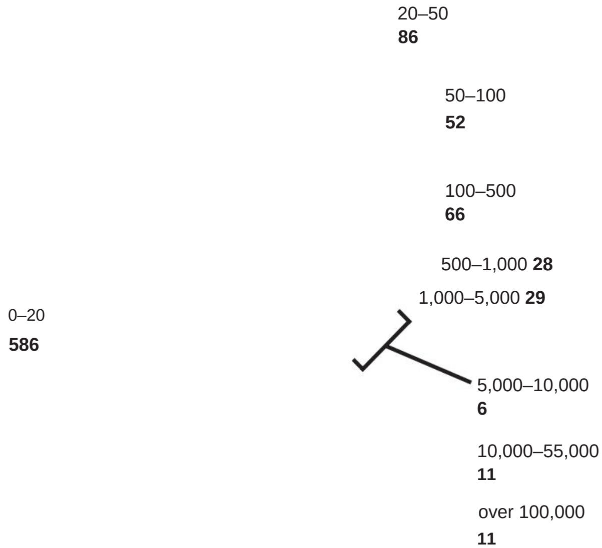
According to statistics from Brewers of Europe for 2016, there were 88.57 breweries and 82.69 microbreweries per million inhabitants in Switzerland. The Craft Beer in Europe study reports 49.29 breweries, which is undoubtedly closer to reality, but in reality there are probably even fewer.

A more detailed and realistic answer to the question of the number of microbreweries or craft breweries is provided by data from the Swiss Federal Customs Administration.

As of 2017, the Swiss customs administration registered 869 breweries. According to graph no. 30, Switzerland has the most "breweries" with an annual production of up to 20 hl, which corresponds to a daily beer production of approximately 5.5 l, so it must undoubtedly be home brewing. Even the next category of up to 50 hl must be considered home brewing. If we were to limit breweries from below by producing 50 hl per year **,229** then in 2017 there were only 197 breweries in Switzerland, of which 181 with a production of up to 10,000 hl. According to these data and the chosen methodology, there would be 23.17 breweries and 21.29 microbreweries per million inhabitants in Switzerland in 2017 .

229 It would definitely be more realistic to push this limit up to 100 hl per year.

Chart No. 29: Development of the number of breweries in Switzerland



Source: *Swiss Federal Customs Administration*

5.10 POLAND

Poland is often perceived by Czech consumers as a country that imports low-quality food to the Czech Republic in large quantities. It is a fact that Poland is the largest importer of beer to the Czech Republic, but this applies mainly to cheap discount beers.

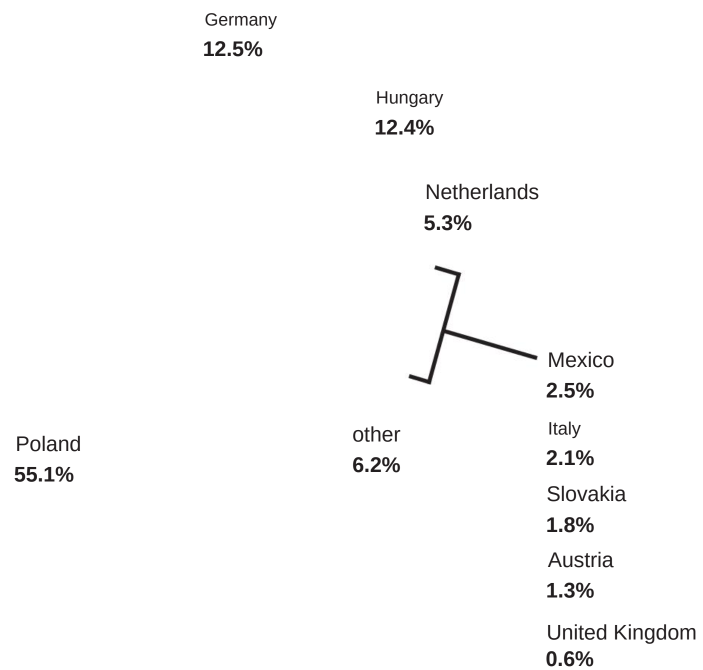
In 2017, 312,403 hl of beer were imported to the Czech Republic, of which 55.1% came from Poland , and most of it was beer sold by chains under their own private labels. Germany is in second place with an eighth share of imports. Low-cost beer is imported from Poland, the average price of a liter of imported beer from Poland is CZK 7.97. For comparison: in the case of imports from Hungary, this value is even CZK 7.49, while beer from Germany or the Netherlands is imported for approximately double the price.230

As in most European countries, both world wars had a great influence on the development of brewing in Poland. Given the fact that Poland moved westward after World War II, it is also problematic to determine the number of breweries at that time . Before World War I, the number of breweries in Poland can be estimated at 500, in 1939 there were 137 and in 1987 only 78,231

230 Own calculations based on CZSO data from October 15, 2018.

231 Racjonalista, Piwo, concerny i wielka polityka [1], available online: <http://www.racjonalista.pl/kk.php/s,9596> [10. 9. 2018].

Chart No. 31: Territorial structure of beer imports to the Czech Republic in percentage (2017)



Source: *CZSO*

Another milestone in the development of Polish brewing was the collapse of the communist regime. After it, the local market was mainly consolidated and multinational companies expanded. The result was the dominance of the three largest companies – SABMiller, Heineken and Carlsberg, which controlled more than 80% of the Polish market. In 2014, SABMiller (Kompania Piwowarska) held 36% of the market, Heineken (Grupa ÿywiec) 30.5% and Carlsberg 18.5%.232 However, between 2008 and 2013, these companies recorded a decline from 88% to 82%,233 which was caused by the expansion of originally only regional breweries to the national level (Van Pur and Perla Browary Lubelskie) and the emergence of microbreweries. The increase in market concentration and unification brought (similarly to the Czech Republic) opportunities for smaller players on the market in the 1990s. During this period, beer production in Poland also grew massively. In 1991, it was at the level of 11.1 million hl, but in 2014 it was already 39 million hl, an average annual increase of an incredible 5.6%.234 This unique situation was caused, among other things, by the increase in domestic demand; this was the largest increase in beer consumption of all countries undergoing economic transformation. Between 1990 and 2014

232 BOGACZ, K., *Najwiÿksze rynki piwa na ÿwiecie,* Przemysÿ Fermentacyjny i Owocowo-Warzywny, 2014, 58, 1, p. 6.

233 CHLEBICA, Aleksandra – FALKOVSI, Jan – LICHOTA, Jan, *From Macro to Micro: The Change,* in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, Cham: Palgrave Macmillan 2018, p. 304.

234 Ibid., p. 299.

The Bierhalle microbrewery in the Polish city of ÿódÿ has a glass brewhouse
Photo: *Tomas Erlich*

Beer consumption per capita increased from 30.5 liters to 98 liters, which was also helped by a decrease in wine and vodka consumption in the period.

The increase in beer consumption led Browar Jablonowo, founded in 1992, to grow to industrial proportions, producing over 200,000 hl in 2017. Van Pur, founded a year later, achieved production of over 750,000 hl in the same year. Van Pur even launched the first ever bottling line for PET bottles in Poland.

Beer from Polish microbreweries is definitely not imported to the Czech Republic, which is a great shame . Many of them produce excellent beers, especially strong top-fermented beers. Polish brewing is therefore largely underappreciated in the Czech Republic.

The numbers of different types of breweries in Poland are not very high (see Table 27).

Table 27: Development of the number of Polish microbreweries

	2010	2016
Microbreweries	10	59
Flying breweries	0	65
Restaurant microbreweries	19	76
Medium breweries	14	16
Large breweries	22	22

Source: *Wojtyra and Grudzieÿ*

235 WOJTYRA, Bartosz – GRUDZIEÿ, ÿukasz, Development of the beer industry in Poland in the period of “the craft beer revolution” (2011–2016), available online: <https://www.re-searchgate.net/profile/Bartosz_Wojtyra/publication/320982497_Development_of_the_beer_industry_in_Poland_in_the_period_of_the_craft_beer_revolution_2011-2016/links/5b7563f192851ca6506447ef/Development-of-the-beer-industry-in-Poland-in-the-period--of-the-craft-beer-revolution-2011-2016.pdf> [15. 11. 2018].

Jablonowo brewery logo
Source: *Browar Jablonowo, available online: <http:// www.beerpubs.com/ graphics/ logoJABLONOWOnew.jpg>* [15. 4. 2019].

Jagiello brewery label
Source: *Jagiello Brewery, available online: <https:// i.colnect.net/ b/ 4141/012/ Chmielak.jpg>* [15. 4. 2019].

Medium-sized breweries have a lower production limit of 20,000 hl per year, so they will not be included in the subsequent figures. In 2010, there were 29 microbreweries in Poland, in October 2016 there were 135 microbreweries and an additional 65 flying breweries.

The availability of data regarding the history of microbreweries in Poland is not favorable, however , ratebeer.com lists Jagiello as the oldest operating Polish microbrewery, which was founded in 1993.

The oldest Polish craft brewery is Browar Goÿciszewo, which was founded in 1991; in 2017, its annual production was around 20,000 hl.

In Poland, the development of microbreweries has brought a renaissance to a number of half-forgotten beer styles. The most famous original local style is *grodziskie beer.*

The style is based on *Grätzer* beer , which was once very popular in northern Germany. *Grodziskie* is a wheat beer (top-fermented) made from smoked malt. After the main fermentation, the young beer is purified with vysin, which are the modified membranes of the swim bladder of some sturgeon fish. The young beer is then matured in bottles, where it is fermented and aged for several weeks. The history of this beer undoubtedly dates back to the Middle Ages and became widespread during the 16th century. The recipe has changed several times, at least in terms of the content of wheat and barley.236 The beer has a rather low alcohol content. In the second half of the 20th century, this beer style gradually disappeared from brewery production. The last brewery to produce it was the Lech brewery in 1993, which, however, ceased operations in the same year.237 Subsequently, this style was revived by homebrewers and microbreweries, making it an integral part of the portfolio of many microbreweries.

236 Polish Homebrewers Association, "Grodziskie redivivus" Project, available online: <https://pspd.org.pl/wp-content/uploads/2017/07/grodziskie-redivivus-raport-1-eng.pdf> [16. 10.2018].

237 Polish Homebrewers Association, Zapomniana tradycja piwa grodziskiego, available online: <https:// pspd.org.pl/wp-content/uploads/2017/05/g-lawniczak-zapomniana-tradycja-piwa- -grodziskiego-przeglad-wielkopolski-2007.pdf> [16. 10/2018].

***Grodziskie* beer in a typical glass**
Source: *Wikipedia Commons, available online: <https:// upload.wikimedia.org/ wikipedia/ commons/ d/ dd/ Piwo_z_Grodziska_2.jpg>* [15. 4. 2019].

Strong to very strong beers are very popular in Poland. The most popular style of strong beers in Poland is *the Baltic porter.* These are dark, usually bottom-fermented beers with a roasted and caramel taste and aroma, sometimes with traces of dried fruit . Perhaps that is why the Czech industrial brewery Primátor is very successful here with its Primátor Double 24 beer with an alcohol content of 10.5%. The majority of the production of this beer goes to Poland.

In Poland, beers flavored with fruit syrup are also quite popular. However, this is more likely to be used to flavor weaker, light bottom-fermented beers – *lagers.*

Table No. 28: Basic indicators of the Polish brewing industry

Poland	2010	2011	2012	2013	2014	2015	2016
Production (million hl)	36,647	38,067	39,294	40,001	40,075	40.89	41.369
Consumption (million hl)	34,484	36,236	37,803	37,388	37,644	37,706	37,903
Consumption l/capita On-	91	95	98	96	98	98	98
trade sales (%)	–	13	10	10	15	15	15
Off-trade sales (%)	–	87	90	90	85	85	85
Imports (thousands of hl)	–	437	637	542	767	717	702
Exports (thousands of hl)	–	2,010	2,227	2,541	2,832	3,257	3,297
Number of breweries	103	117	132	155	133	150	210
Number of microbreweries	55	–	50	–	–	–	–

Source: *Brewers of Europe*

Poland, like the Czech Republic, has high exports and low imports of beer . The share of imports in consumption was 1.85% in 2016, which is comparable to the Czech Republic. Exports significantly exceed imports. At the same time, Poland has one of the highest beer consumption per capita at 98 liters, with a growing trend.

In 2016, there were 5.46 breweries per million inhabitants and 3.51 microbreweries per million inhabitants in Poland (excluding flying breweries).

5.11 DENMARK

Denmark is a small European country with a very rich beer culture and a promisingly developing craft beer segment.

Brewing in Denmark developed in a very similar way to many other countries. After World War II, there were almost 200 breweries in Denmark, which is comparable to the Czech Republic at that time in terms of per capita. However, these were mostly small local breweries. By the turn of the millennium, there were only sixteen.

But let us go back even further in history. A major milestone for Danish brewing was the year 1847, when the Carlsberg brewery was founded in Copenhagen, where in 1883 Christian Hansen isolated a pure yeast culture for the production of bottom-fermented beers. Carlsberg became the dominant Danish brewery. In the 1990s, the market share of the Carlsberg brewery in Denmark reached its maximum and has been gradually declining since then . In 2012, it reached 57.1%,[238] in 2017 it was only 54%.[239] Microbreweries have a market share of just over 5%. The dominance of *lagers and pilsners* is still huge in Denmark, in 2016 it was as much as 95%.[240]

Danish beer production is not particularly large given its small population , but relative figures are often very high. In Europe and probably in the world, Denmark has the third largest share of beer production exports, at 57.74%.

Only Belgium, with the Netherlands closely behind, has a higher value. In recent years, beer consumption per capita has been falling here, as in almost everywhere else in the developed world.

238 Berlingske, Beer in Denmark, available online: <https://www.b.dk/upload/Premium/Danske_rapporter/AD-DK-beer.pdf> [17. 10/2018].

239 Statista, Market share of the Carlsberg Group in Western Europe in 2017, by country, available online: <https://www.statista.com/statistics/781214/market-share-of-the-carlsberg-group--in-western-europe-by-country/> [17. 10/2018].

240 Landbrug & Fødevarer, The Danish beer and soft drink market 2017, available online: <https://lf.dk/~/media/lf/for-members/company-members-of-the-company/ingrediensnyhedsbrev/2017/oktober17/bryggeriforeningen.pdf?la=da> [17. 10/2018].

The so-called Elephant Gate leading to the original Carlsberg brewery in Copenhagen
Source: *Wikipedia Commons, available online: <https:// upload.wikimedia.org/ wikipedia/ commons/ 0/08/ Carlsberg_ Elephant_Gate.jpg>* [15. 4. 2019].

Table 29: Basic indicators of the Danish brewing industry

Denmark	2010	2011	2012	2013	2014	2015	2016
Production (million hl)	6,335	6.59	6.08	6,166	6.11	5.97	6.2
Consumption (million hl)	3,589	3,654	3,347	3.53	3.65	3.43	3.58
Consumption per capita (l)	69	68	64	64	65	60	62
On-trade sales (%)	–	23	25	25	25	23	23
Off-trade sales (%)	–	77	75	75	75	77	77
Imports (thousand hl)	–	348	296	415	374	540	575
Exports (million hl)	–	3.37	2.93	3,019	3.04	3,015	3,084
Number of breweries	–	150	150	150	150	150	160
Number of microbreweries	–	–	–	130	130	130	130

Source: *Brewers of Europe*

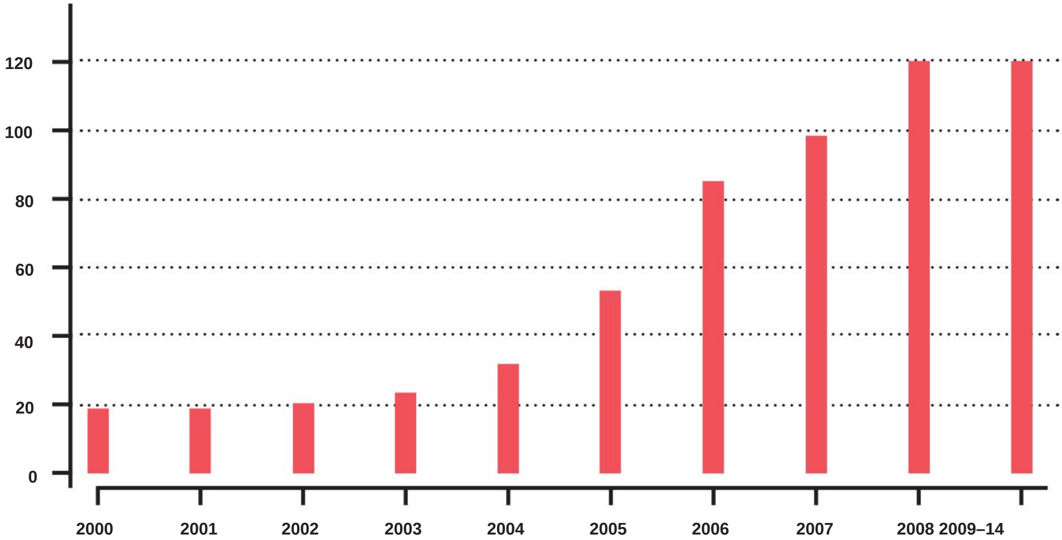
A certain problem may be the quantification of the number of breweries, or microbreweries, in Table 29 ; the values are suspiciously stable and rounded to tens.

From graph no. 32 it is clear that the microbrewery boom in Denmark took place over a few years, specifically between 2003 and 2008, when the number of microbreweries increased by about fivefold and then remained stable. More recent data is provided by beerticker.dk , which mentions 172 breweries for 2015241 and 187 breweries for 2016242

241 Beer Ticker, Record: 1,298 nyedanskeøl i 2015 – nu 172 bryggerier, available online: <https:// beerticker.dk/rekord-1298-nye-danske-oel-i-2015-52238> [16. 10. 2018].

242 Beer Ticker, Record: 1,424 nyedanskeøl i 2016 – nu 187 bryggerier, available online: <https:// beerticker.dk/rekord-1-424-nye-danske-oel-i-2016-nu-187-bryggerier-52767> [16. 10. 2018].

Chart No. 32: Development of the number of breweries in Denmark (2000–2014)



Source: *Bentzen and Smith in Garavaglia and Swinnen244*

and 197 breweries for 2017243. The same source also lists the number of new beers produced in Denmark.

A huge motivation for entering the microbrewery sector in Denmark is the extremely high price level of local goods, which is one of the absolutely crucial factors for the existence of a distinctive microbrewery sector.

The number of beers in the mentioned period has been growing at an almost rocket pace, especially since 2011. The vast majority of them are top-fermented beers; if there is a new *lager,* it is generally cold-hopped and is in the *India pale lager style.245* Cold hopping is not used in the production of traditional *lager ,* but in this case it is, which partially adopts the technology used in the production of the *India pale ale* style .

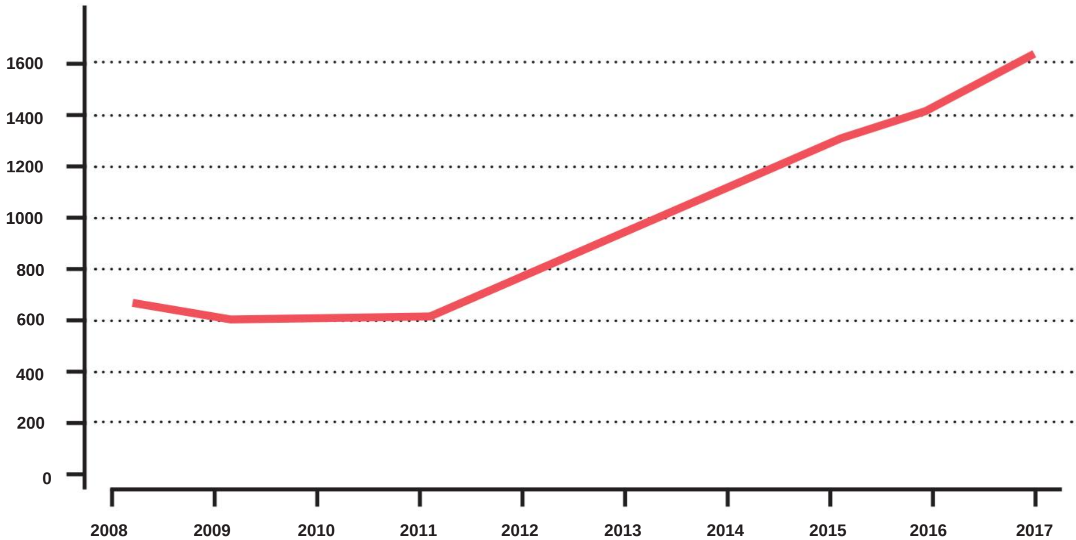
The first microbrewery, or rather a restaurant microbrewery, was opened in Denmark in 1990 and is called Apollo. It is located right in Copenhagen and lives more from tourism. The Mikkeller brewery, which was founded in 2005, has achieved the greatest fame, including in the Czech Republic. It is a so-called flying brewery. Of all the Danish breweries, it has the widest product portfolio, the website ratebeer.com states that the total

243 Beer Ticker, Rekorder: 1.622 nyedanskeøl i 2017 – hele 30 nyebryggerierpå et år, available online: <https://beerticker.dk/rekorder-1-622-nye-danske-oel-i-2017-hele-30-nye-bryggerier-paa-et-aar-52809> [16. 10/2018].

244 BENTZEN, Jan – SMITH, Waldemar, Entry, *Survival, and Profits: The Emergence of Microbreweries in Denmark,* in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, Cham 2018, p. 162.

245 This is a hybrid between *a lager* and *an IPA style.*

Chart 33: Number of new beers in Denmark (2008–2017)



Source: *Beer Ticker*

an incredible 1,018 beers.246 Just for comparison: according to the same source, the Czech record holder is the Permon brewery with 119 beers.

Danish flying brewery Mikkeller
Source: Mikkeller Brewery, available online: <https:// blog.mikkeller.dk/ hs-fs/ hubfs/ Mikkeller.HS_.logo_-300x218. jpg?width=300&name=Mikkeller.HS_.logo_-300x218.jpg> [15. 4. 2019].

In Danish beer culture, the so-called J-Dag has become a tradition, which can be loosely translated as Christmas Day, i.e. the day when special Christmas beers (Julebryg) go on sale. This tradition was founded in 1980 by the Tuborg brand. It has been officially recognized since 1990 and other breweries have since joined. Beer starts being sold that day at exactly 20:59, due to the often disorderly consumption of this strong beer by young people, J-Dag was moved from Wednesday to Friday in 1999. Friday has remained, but the date has changed several times throughout history, until it has been fixed on the first Friday in November since 2010.

246 Rate Beer, Denmark Breweries, available online: <https:// www.ratebeer.com/breweries/denmark/0/58/> [17. 11. 2018].

Danish Christmas beer Julebryg
Source: *Wikipedia Commons, available online: <https:// upload.wikimedia.org/ wikipedia/ commons/ b/ b3/ Tuborg_ Julebryg_01.jpeg>* [15. 4. 2019].

If there is one beer style that stands out in Denmark, it is *hvidtøl* , or *white beer,* which has its roots in the 18th century. The malt used for this beer was dried in warm air, rather than in the smoke that was widespread at the time. It was therefore lighter in colour, and the beer made from it was also called white beer. This beer was traditionally consumed with spirits.247 In 1914, 143,000 hl were produced, but its production gradually began to decline and was completely discontinued in 1968.248 The renaissance came with the development of microbreweries and craft breweries. Today, this beer can have a maximum of 2.25% alcohol, which is a consequence of restrictive laws from the 19th century. The beer is extremely lightly fermented, which is why it is characterized by high maltiness a

According to the most realistic data available, there were 34.32 breweries in Denmark in 2017. per million inhabitants and 31.36 microbreweries per million inhabitants.

247 BOJE, Per - JOHANSEN, Hans Chr., *The Danish Brewing Industry after 1880,* in: GOURVISH, Terry - WILSON, Richard G., The Dynamics of the Modern Brewing Industry Since 1880, London, 1998, p. 46.

248 Den Gamle Bryggergaard, Sålandlavede man hvidtøl, available online: <http:// www.fjerritslevmuseum.dk/hvidtoel/> [17. 10/2018].

5.12 NETHERLANDS

In 1980, the Dutch beer market could be described as a " pilsner *desert."* The market was extremely homogeneous, and even tasters were unable to distinguish the differences between beers in blind tests.249 However, the situation began to change rapidly thereafter.

The onset of market concentration (and globalization) was very strong in the case of the Netherlands ; in 1900 there were 503 independent breweries in the Netherlands, in 1940 there were only 98 independent breweries250 and in 1980 there were only 13,251 left.

The first signs of change can be identified in the 1970s, when not microbreweries but the first four beer bars were established. These were De Beyerd in Breda, Jan Primus in Utrecht, Gollem in Amsterdam and Pumpke in Nijmegen.252 These beer bars began to offer *ale* -type beers imported mainly from Belgium, but also other beers from Germany and the United Kingdom.

Another significant step was the establishment of the consumer organisation PINT on 14 October 1980 by some Dutch members of the British consumer organisation CAMRA.253 In 2018, this organisation had 4,500 members.254

The establishment of this organization also led to the first, albeit very cautious, establishment of microbreweries. The De Arcense Stoombierbrouwerij microbrewery was established in Arcen in 1981. The founders were former employees of a larger brewing company, which is a very typical phenomenon all over the world. In the following five years, nine more microbreweries were established, all of which were mainly dedicated to the production of traditional beers. Between 1986 and 2003, sixty more breweries entered the Dutch market.255 In 2003, the Small Breweries Association was founded, with about half of the Dutch microbreweries as members.

In 2015, a total of 382 craft breweries were listed in the Netherlands, of which 188 were flying breweries without their own technology.

The Netherlands is one of three countries in Europe, and probably the world, where more than half of its production is exported. It is second only to Belgium (and ahead of Denmark). As in almost every developed country, beer consumption per capita is currently slightly

249 van DIJK, Michiel – KROEZEN, Jochem – SLOB, Bart, *From Pilsner Desert to Craft Beer Oasis: The Rise of Craft Brewing in the Netherlands,* in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, Economic Perspectives on Craft Beer, Cham 2018.

250 SIMONS, JFLM, *De Limburgsebrouwwereld en de opkomst van de ondergisting, 1870–1940,* in: DEEL, Negende (edd.), Jaarboek voor de geschiedenis van bedrijf en techniek, Amsterdam 1992, p. 126 and 131.

251 Nedelandse Biercultuur, De Nederlandse biercultuur heefteenrijkverleden en ookeenprachtige-toekomst, available online: <https://www.nederlandsebiercultuur.nl/> [15. 12. 2018].

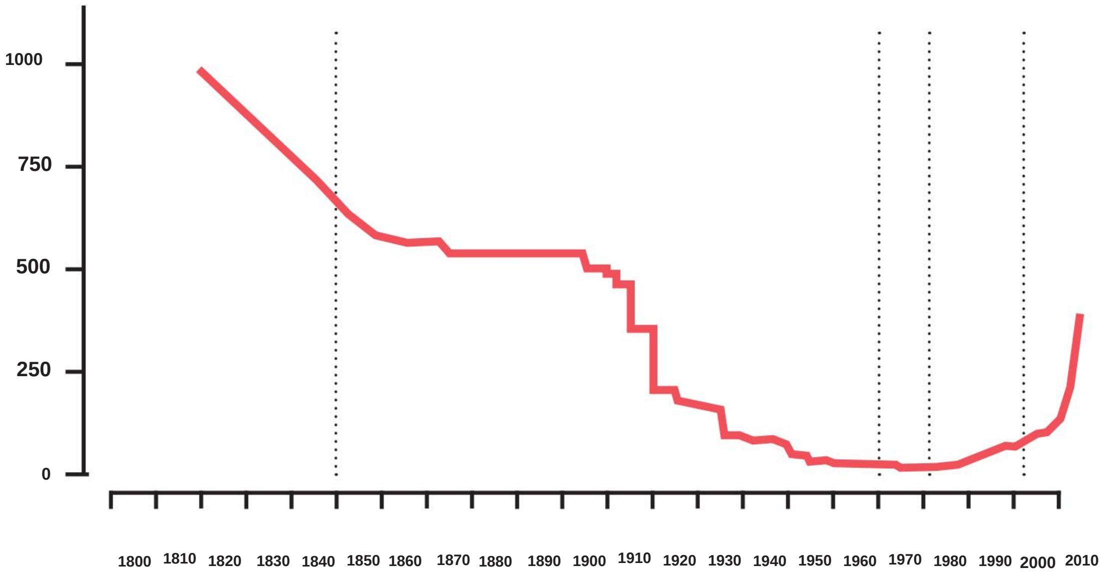
252 van DIJK, M. – KROEZEN, J. – SLOB, B., *From Pilsner Desert,* cd, p. 268.

253 European Beer Guide, Dutch Breweries, available online: <https://www.europeanbeerguide.net/hollintr.htm> [17. 10. 2018].

254 Pint, Bier Consumenten Vereniging Pint, available online: <https://www.pint.nl/over-pint/> [17. 10. 2018].

255 VAN DIJK, M. – KROEZEN, J. – SLOB, B., *From Pilsner Desert,* cd, p. 272.

Chart No. 34: Development of the number of breweries in the Netherlands



Source: *van DIJK, Michiel – KROEZEN, Jochem – SLOB, Bart,* From Pilsner Desert to Craft Beer Oasis: The Rise of Craft Brewing in the Netherlands, *in: GARAVAGLIA, Christian – SWINNEN, Johan (edd.), Economic Perspectives on Craft Beer, cd, p. 268.*

Logo of the Dutch consumer organization PINT
Source: *PINT*

is decreasing. However, imports are relatively significant, accounting for a non-negligible share of consumption . In 2016, it was 15%. A very problematic indicator in Table 30 is the number of breweries, as mentioned above, they also include flying breweries, which significantly distorts the statistics. The website statista.com lists 588 breweries in the Netherlands as of January 2018,256 but again flying breweries are also included.

256 Statista, Totalnumber of activebreweries in the Netherlands in December 2018, by province, available online: <https://www.statista.com/statistics/713776/number-of-breweries-in-the- -netherlands-by-province/ > [18. 11. 2018].

Ratebeer.com listed 332 microbreweries and craft breweries and 29 commercial breweries as of 2018 , for a total of 361. In 2018, there were 20.79 breweries per million inhabitants and 19.12 microbreweries and craft breweries per million inhabitants in the Netherlands .

Table 30: Basic indicators of the Dutch brewing industry

Netherlands	2010	2011	2012	2013	2014	2015	2016
Production (million hl)	24,218	23,644	24,271	23,636	23,726	24,012	24,559
Consumption (million hl)	11,956	11,974	12,122	11,721	11,326	11,696	11,862
Consumption per capita (l)	72	72	72	70	68	68	69
On-trade sales (%)	–	26	27	25	35	35	35
Off-trade sales (%)	–	74	73	75	65	65	65
Imports (million hl)	–	2,437	2,759	2,058	1,647	1,652	1.78
Exports (million hl)	–	13.94	14,727	14,182	13,958	14,133	14,477
Number of breweries	–	125	165	–	263	320	400

Source: *Brewers of Europe*

CONCLUSION

In developed economies, microbreweries and craft breweries have an absolutely key influence on the formation of the consumer market, although their purely market (economic) share is usually only in units of percent. The greatest importance lies in maintaining, or rather expanding, the variety of production for consumers. Variety is what microbreweries and craft breweries base their strategies on. Thanks to these strategies, a whole range of marginal or long-extinct beer styles have emerged or survived, for example, Belgian *witbier,* Polish *grodziskie* or Danish *hvidtøl.* Finally , it is also true that microbreweries and craft breweries develop and interpret the dominant beer style. In all this, they throw down a virtual gauntlet to the brewing giants to adapt to such developments. It can be stated that in Czech conditions, the imaginary critical limit for the share of microbreweries is 0.5%, at which point large industrial breweries were forced to begin adapting to the trends of increasing market diversity.

The phenomenon of microbreweries and craft breweries is a recent phenomenon from a historical perspective. Such a large increase in smaller "food" operations in the last few decades is unprecedented in the entire food industry. Somewhat poetically, this phenomenon can be called living water for the brewing industry. It must be remembered that the barriers to entry into this industry are by no means low . On the contrary, entry into the brewing industry is a very costly investment activity and various administrative barriers are also a significant aspect.

If a microbrewery is managed at least moderately in Czech conditions , its economic viability is very high and the same applies to profitability . However, it is always necessary to remember that the microbrewery and craft brewery segment differs from the majority beer market and that producers must base their product on the relative uniqueness of their product. It is also necessary to adapt the business strategy, especially the pricing policy, to this aspect. A microbrewery or craft brewery can therefore never have cheaper production than a regular industrial brewery. It has significantly higher production costs and, above all, a much higher share of human labor. This is offset by significantly lower marketing and transaction costs, because microbreweries and craft breweries usually do not have their own distribution network and do not have a specialized export department. In contrast, industrial breweries usually have an export department. It is often possible to find that microbreweries or craft breweries in the Czech Republic derive their pricing policy from the company Plzeÿský Prazdroj, or rather from its brand Pilsner Urquell.

The process of unification (not only in brewing) was started by the industrial revolution and the accumulation of capital in the second half of the 19th century. Hand in hand with this phenomenon, brewing markets were usually liberalized. This created very suitable conditions for the growth of market concentration, which was initially creeping. This concentration hit full force after the Second World War. Its growth was largely contributed to by the developing television broadcasting and the related advertising, at least as far as democratic and developed countries are concerned. In the case of communist countries, there was a forced massive nationalization at the beginning of that era. The markets in these countries were concentrated by central administrative planning. The developed Western democracies, led by the United States of America, went through a process of concentration and unification of the brewing industry during the few decades after the end of the Second World War. Beer was constantly getting cheaper in relation to the real purchasing power of the population . However, price was not often the main motive for consumers to decide on the level of consumption. Consumers gradually began to get tired of the tasteless and uninteresting product and many of them had fixed that beer equaled a light, lighter and less bitter *lager.* As purchasing power increased, the demand for beers with stronger flavors grew. These were often extinct beer styles whose recipes were preserved in old books, or in the case of a short break in production, these beer styles began to be brought back to the market by the brewery's own connoisseurs.

In the 1960s, 1970s and 1980s, smaller breweries began to emerge in many countries, usually with their own restaurants. This marked a significant departure from the mainstream industrial breweries, which were already completely alienated from consumers . The impersonal large brewing giants of the time spoke to consumers primarily through impersonal advertising, while microbreweries and craft breweries offered something more substantial: tangible stories and a more diverse range of products.

The world has become increasingly over-technological, and so many consumers have also begun to see something original in microbreweries, something less affected by science. -technical development. In Czech conditions, microbreweries often try to emphasize a kind of connection to places where beer was brewed in the past.

To this day, microbreweries and craft breweries have a significantly higher share of human labor, and with a few exceptions, they produce unfiltered beers, which consumers understand as a return to nature and more natural (healthier) products.

The market segments of microbreweries and craft breweries in individual countries have a number of common denominators, but two of them are crucial. First, the country must have a developed economy and the purchasing power of the population must be at a high level, because from the point of view of economic theory, beers from microbreweries and craft breweries can be considered a luxury good. Second, market concentration and market unification must reach such a level that a certain part of consumers find the brewery market uninteresting and boring and start to demand other beer styles. However, the degree of unification and concentration varies considerably from country to country. In the United States of America in the 1970s, product unification was absolute, while Germany (or West Germany) and Belgium stood at the opposite pole, where the markets were still very diverse, and therefore the rise of microbreweries and craft breweries was significantly slower there. However, this is not the only difference between individual states; other differences include different historical development, regulation and legal framework, preferences consumers, natural conditions and market size. The combination of the above factors is the key to the specificity of the brewing and microbrewery markets in different countries.

Table 31 shows the number of breweries and microbreweries per million inhabitants in selected countries of the world. Breweries without their own technology, for which the expression flying breweries has become popular in the Czech Republic, are not included.

Table 31: Breweries and microbreweries per million inhabitants in selected countries of the world

State	Microbreweries	All breweries	Index of microbreweries / all breweries
Czechia	36.38	40.62	89.56
U.S.A.	16.61	16.81	98.81
United Kingdom	33.28	34.07	97.68
Slovakia	11.03	12.86	85.77
Ireland	13.03	19.55	66.65
Belgium	–	19.57	–
Germany	8.98	17.13	52.42
Japan	–	1.33	–
Italy	11.87	12.41	95.65
Switzerland	21.29	23.17	91.89
Poland	3.51	5.46	64.29
Denmark	31.36	34.32	91.38
Netherlands	19.12	20.79	91.97

Source: *Own calculations, Brewers Association and Brewers of Europe*

Note: In the case of the Czech Republic, the data is for 2017, in the case of other countries, it is for 2016.

Table 31 shows that the Czech Republic has the highest number of microbreweries and breweries per million inhabitants. In the case of microbreweries, this value is 36.38, and in the case of all breweries, it is 40.62. The only country that comes close to these values is the United Kingdom, which ruled this imaginary ladder for many years , which was mainly due to the fact that microbreweries began to be established here approximately twenty years earlier than in the Czech Republic. The United Kingdom thus had a huge lead in this quantitative indicator.

If we compare regional differences only in the Czech Republic, the highest number per million inhabitants is achieved in the Pilsen region. Undoubtedly, historical development and geographical proximity to Bavaria will play a significant role in this case. Prague, where the purchasing power of the population is the highest, is surprisingly only third from the bottom, with only the Pardubice and Liberec regions ranking “worse”.

In the Czech Republic, a number of microbreweries or craft breweries claim to be part of a historical tradition, most often a specific brewery that previously operated in a given village or locality. However, much more interesting is the revival of beer brewing in its original form.

According to the methodology used here, there are 9% of such breweries in the Czech Republic, and they are often original, unforgettable architectural industrial gems from the second half of the 19th century, which were lucky not only not to be demolished, but especially to find an enthusiastic investor who returned beer production to them.

Czech microbreweries continue to maintain a certain level of conservatism in production . For 97% of them, Czech *lager is the core product,* only 3% produce only top-fermented beers. The number of breweries in the Czech Republic in 2017 was comparable to the number in the mid-1930s, but that is where all further similarities end. While the number used to decrease rapidly, in 2017 the opposite was true. In the 1930s, all breweries produced only bottom-fermented beers and there was no clear dividing line between large and small, as there was in 2017 between industrial breweries and microbreweries or craft breweries. If the trend of establishing microbreweries established in 2011 continues, it cannot be ruled out that within the next few years the Czech Republic could have up to a thousand microbreweries.
Such a number of brewery operations in the Czech Republic was last recorded at the end of the 19th century.

RESUME

In developed economies, microbreweries and craft breweries have a crucial impact on the formation of the consumer market, although their purely economic share of the market tends to amount to single digits. Their greatest contribution rests in the maintenance and expansion of the product range for consumers. Variety is at the core of microbreweries' and craft breweries' strategy. Thanks to this focus, many marginal or long-abandoned beer styles survived, were revived, or created anew.
As examples, let us mention for instance the Belgian *witbier,* Polish *grodziskie,* or Danish *hvidtøl.* And finally, microbreweries and craft breweries develop and interpret the dominant beer style, thus challenging the 'brewery giants' and forcing them to react to these developments. In the Czech lands, it seems that the critical limit of microbreweries' share is around 0.5% of the market. Above that

line, even large industrial breweries have to start reacting to new trends thus introduced to the market.

From a historical perspective, the phenomenon of microbreweries and craft breweries is rather new. In recent decades, the growth we witness in this sector is unparalleled within the food and drinks industry as a whole. Somewhat poetically, one could view it as 'water of life' for the brewery sector. Moreover, one should bear in mind that entering the microbrewery or craft brewery business is far from easy or simple. To start brewing is financially demanding and administrative barriers also present a formidable challenge.

Nevertheless, in Czech conditions, if a microbrewery has at least decent management, its economic viability is high and the same applies to its profitability.
One should, however, bear in mind that the microbrewery and craft brewery sector is clearly distinct from the mass beer market and producers must build on their product's distinctiveness. This should be reflected in their business strategy and especially in their price policy. Beer coming from a microbrewery or craft brewery can never be cheaper than beer coming from a mainstream industrial brewery. Its production costs are significantly higher, and more labor is involved. This is usually compensated by markedly lower marketing and transaction costs, since microbreweries and craft breweries usually do not have their own distribution network, and none have specialist export departments. Industrial breweries, on the other hand, usually have a dedicated export department. In the Czech Republic, however, many microbreweries and craft breweries tend to derive their price policy from prices set by the Plzeÿský Prazdroj company or rather its brand, the Pilsner Urquell.

The process of unification (not only in the brewing business) started with the industrial revolution and accumulation of capital in the second half of the nineteenth century. Hand in hand with this phenomenon, brewery markets were

liberalised, which led to growing concentration on the market. At first, the process was gradual, but after the Second World War, concentration struck with full force. In democratic and developed countries, this process was to a large extent driven by fast-spreading television forecasts and the advertisement industry. In Communist countries, a process of forced nationalization took place at the beginning of this era and markets in countries of the Eastern Bloc were concentrated by central administrative planning. Developed western democracies, especially the United States, experienced this process of concentration and unification of beer brewing within a few short decades after the end of the war. This went hand in hand

with beer becoming ever cheaper in relation to the population's real purchasing power. On the other hand, though, consumers soon stopped seeing price as the decisive factor which determined the amount of consumption. Consumers soon became tired of the neutral and uninteresting tastes of mass-produced beer and many started to identify beer with light-colored and light-tasting lager with little bitterness. As purchasing power grew, so did the demand for beers of more pronounced and individual taste. In many cases, this demand was met by previously discontinued beer styles whose recipes survived in old books or beers which were simply returned by breweries to the market after some intermission.

In the 1960s, 1970s, and 1980s, smaller breweries started emerging in a number of countries. In many cases, they had their own restaurants, which clearly distinguished them from the by now completely impersonal mainstream. Alienated large beer producers were addressing consumers mainly via impersonal ads, while microbreweries and craft breweries offered a substantial bonus in the form of more tangible stories and a wider variety of products. In a world that was becoming ever more technology-driven, many consumers also came to view microbreweries as something closer to the roots, something untouched by technological and scientific development. In the Czech Lands, microbreweries also tend to emphasize some sort of link to old establishments with beer-brewing rights. To this day, microbreweries and craft breweries rely on a significantly higher amount of manual labor and save for a few exceptions produce unfiltered beers, which consumers perceive as a return to nature and more natural (healthier) products.

The relative market segments of microbreweries and craft breweries in various states have a number of shared elements, two of which are crucial. First of all, the state has to have a developed economy and sufficiently high purchasing power of the population, since from the viewpoint of economic theory, beers produced by microbreweries and craft breweries can be viewed as a luxury item.

Secondly, the concentration and unification of the market must reach a certain degree, to wit a level where some consumers find the beer market unattractive and uninteresting and start searching for new beer styles. Nevertheless, the level of unification and concentration in various states varies. For instance, in the USA in the 1970s, unification of the product was absolute, while in Germany (at that time West Germany) and Belgium, markets were much more varied, which is also why in these countries, the rise of microbreweries and craft breweries was notably slower. That is not, however, the only relevant difference between various countries in relation to brewing. Other factors include differences in historical development, regulation, legal framework, consumer preferences, natural conditions, and market size. A combination of the above-mentioned factors produces the specific features of the brewery and microbrewery market in particular countries.

The table below lists the number of breweries and microbreweries per million people in selected states around the world. It does not include breweries without their own technology, ie enterprises which in Czech are known as 'flying breweries'.

Table No. 1: Breweries and microbreweries per million people in selected countries.

State	Microbreweries	All breweries	Index microbreweries/ breweries total
Czech Republic	36.38	40.62	89.56
USA	16.61	16.81	98.81
Great Britain	33.28	34.07	97.68
Slovakia	11.03	12.86	85.77
Ireland	13.03	19.55	66.65
Belgium	–	19.57	–
Germany	8.98	17.13	52.42
Japan	–	1.33	–
Italy	11.87	12.41	95.65
Switzerland	21.29	23.17	91.89
Poland	3.51	5.46	64.29
Denmark	31.36	34.32	91.38
Netherlands	19.12	20.79	91.97

Source: *own calculation, Brewers Association, and Brewers of Europe*

Note: For the Czech Republic, data from 2017 are listed. In other countries, figures are for 2016.

This table shows that the Czech Republic has the highest number of microbreweries and breweries per million inhabitants. For microbreweries, the figure is 36.38, for breweries of all kinds, it is 40.62. The only other state that comes close to these figures is Great Britain, which for a long time clearly dominated this list.

That was in part due to the fact that microbreweries started operating here about twenty years earlier than in the Czech Republic. Great Britain thus had a vast advantage in this quantitative indicator.

If we were to compare regional differences within the Czech Republic, most breweries per capita are in the Pilsen region. This is clearly due to historical development and geographical proximity to Bavaria. Prague, on the other hand, which has the highest purchasing power of all Czech and Moravian regions, is surprisingly the third from the bottom, with only the Pardubice and Liberec regions having fewer per capita breweries.

In Bohemia, many microbreweries and craft breweries endorse some sort of historical tradition, usually a tradition of an older brewery which used to exist in their particular village or locality. Nevertheless, even more interesting is the return to beer brewing in the original premises. According to our figures, this is the case of 9% of breweries, which in many cases function in unique, irreplaceable jewels of industrial architecture from the second half of the nineteenth century, which were not only fortunate enough to escape demolition but also lucky enough to find an enthusiastic investor who restarted beer production.

In terms of production, Czech microbreweries tend to be somewhat conservative . A total of 97% rely mainly on Czech lager and only 3% produce top-fermented beers. The number of breweries in 2017 was comparable to the number of breweries in the 1930s, but that is where the similarity ends. During the 1930s, the number of breweries was rapidly shrinking, now we witness the opposite trend. In the 1930s, all breweries produced only bottom-fermented beers and there was no clear distinction between large and small producers, while in 2017 the distinction between industrial breweries and microbreweries or craft breweries was obvious. If the rise of microbrewing which started in 2011 were to continue, it is possible that in a few years, there could be up to one thousand microbreweries in the Czech Republic.

The last time this kind of increase in the number of beer brewing establishments was observed in this country was in the late nineteenth century.

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ANNEXES

ANNEX NO. 1: CLOSED MINIBREWERIES IN 1991–2017

1.	Sviništany Melon	(1991–1998)
2.	Grandma	(1991–2002) 257
3.	HBH Brno	(1992–1993)
4.	HBH Tabor	(1994–1995)
5.	U Zezuláký Hradec Králové	(1993–1997)
6.	Baron Jicin	(1993–1997)
7.	Roznov Valašsky	(1994–1997)
8.	Boskovice	(1995)258
9.	U Vozký Liberec	(1995–2003)
10.	Bavaria Slusovice	(1996–1997)
11.	Salvet Slušovice	(1997–1999)
12.	Minibrewery Balkan Uhersky Brod	(1998–2012)
13.	K + N Seismic	(1999–2008)
14.	Hop Store Prague	(1999)
15.	Urban Postoloprty	(2000–2001)
16.	Frog	(2001–2003)
17.	Patriot Jihlava	(2001–2002)
18.	Rambousek microbrewery Hradec Králové	(2002–2016)
19.	Roztoky near Kÿivoklát	(2003) 259
20.	Smoker Cheb	(2003–2005)
21.	Celebrated	(2003–2012)
22.	Arthur's Frydek Mistek	(2004–2007)
23.	Koprivnice Volcano	(2004–2009)
24.	Freud Cutlery	(2004–2008)
25.	Xaver Bluÿina	(2005–2008)

257 It was not a completely commercial microbrewery, a group of students regularly brewed beer on relatively sophisticated equipment.

258 Only a few batches were brewed at the Jarošov brewery, and the wort was then fermented in Boskovice.

259 It was only put into operation, but not into regular commercial operation.

26.	Velichov	(2005–2014)
27.	Pablo's Tacos Jihlava	(2007) **260**
28.	Vorel Kladno	(2007–2009)
29.	U Rybiÿeky Silver	(2007–2012)
30.	U Formánkÿ Hostivice	(2010–2013)
31.	Shoemaker Zlin	(2010–2012)
32.	1st Chodský brewery in Moravia Šitboÿice	(2012–2016)
33.	Soldier Hodonin	(2013–2017)
34.	Hutisko-Solanec	(2014–2016)
35.	Mazal Prostejov	(2013–2015)
36.	Czechmanek Zlin	(2013–2014)
37.	Nota Bene Prague	(2015–2017)
38.	Brandys nad Labem Ondra	(2015–2017)

Note: The list does not take into account (mini)breweries that have been closed and reopened. For example, the former Kácov microbrewery was closed by the communists in 1957, reopened in 1993, closed again in 1996, and finally started brewing beer again at the end of 2001.
In 2007, it exceeded the 10,000 hl mark and thus fell out of the microbrewery category.

260 It was never put into operation, it was immediately dismantled after assembly.

ANNEX 2: FLYING BREWERIES

2007	**Two Tales Brewing**	Prague
2008	**Bohemia Classic**	Stone house
2010	**Homemaker Mosquito**	Prague
2012	**Sachsenberg Brewery**	Cesky Tesin
2012	**Flying brewery Falkon**	Zatec
2012	**Prague Laffe Brewery**	Prague
2012	**Holy Farm Brewery**	Petrov
2013	**First colloquial**	Talk
2013	**Flying brewery Piveÿka**	Rousínov
2013	**Kutna Hora Brewery**	Kutna Hora
2013	**Starosta Brewery**	Prague-Karlin
2013	**Beerest Czech**	Prague
2014	**Blahovar Brewery**	Pilsen
2014	**Malešice microbrewery**	Prague
2014	**Malt Brewery**	Litvinovice
2014	**Novopražský brewery**	Prague
2014	**Albert Nomadic Brewery**	Brno
2014	**Baraba Brewery**	Cesky Tesin
2014	**Klínec-Katz Brewery**	Klinec
2014	**Flying brewery Bad Flash Beers**	Prague-Bubeneÿ
2014	**Flying Baran Brewery**	Uherske Hradiste
2014	**Pacov brewery in Mytince**	Ricany
2015	**Provincial craft brewery**	Prague
2015	**Dragonfly Flying Brewery**	Brno
2015	**Mazany Lisak Brewery**	Zdar nad Sazavou
2015	**Pepe**	Zdar nad Sazavou
2015	**Flying brewery ÿerný potoka**	Jicin
2015	**Flying brewery UHáÿko**	Uherske Hradiste

2016	**Krumlov microbrewery**	Moravian Krumlov
2016	**Slovácko brewery**	Shardice
2016	**Flying Homeless Man**	Ostrava
2016	**Crazy Clown Brewery**	Prague
2016	**Sternberg Brewery**	Sternberk
2016	**Sternberger microbrewery**	Sternberk
2016	**Telÿ brewery**	Telc
2016	**Flying brewery Delbeer**	Prostejov
2016	**Chroust Brewery**	Prague-Sedlec
2016	**Pluton Brewery**	Proud
2016	**Flying brewery Koÿovný Kozi**	Brno
2016	**Sibeeria Craft Brewery**	Prague
2016	**Flying Brewery 2 Bald Men**	Klimkovice
2016	**Neighborhood brewery Holá ÿiÿ**	Prague
2016	**Flying Brewery Black Cat**	Pilsen
2016	**Repete Brewery**	Brno
2016	**The deputy's flying one**	Red Lhota
2016	**Rodák nomadic brewery**	Prostejov
2016	**3-legged stag brewery**	Unhost
2016	**Flying brewery Little Janek**	Prague
2016	**U2D Gybsy Brewery**	Opava
2016	**Blackdog Group**	Beroun
2016	**Schrott Brewing Company**	Brno-Trnita
2017	**Beer Poets Flying Brewery**	Pardubice
2017	**Hangar Brewery**	Prague
2017	**The Scarecrow Brewery**	New Spooky
2017	**Flying brewery O.SKAR**	Jablonec nad Nisou
2017	**Toothy Dog Brew**	Prague-Vrsovice

2017	**Flying brewery Dachovar**	Liberec
2017	**SQBRU flying brewery**	Prague
2017	**Patchwork Flying Brewery**	Prague
2017	**Flying brewery Liberbeer**	Prague
2017	**Erlich Bier Flying Brewery**	Prague
2017	**Illegal Brewery**	Kladno
2017	**Flying brewery ÿestmír**	Prague
2017	**Lípák Brewery**	Czech Lipa
2017	**Beerocracy Craft Brewery**	Ostrava
2017	**Flying brewery Zbraslavská koza**	Prague-Zbraslav
2017	**Brewniverse nomadic brewery**	Brno
2017	**Isao Brewery**	Prague
2017	**Bat Beer Flying Brewery Juliánov**	Brno
2017	**Olešná Brewery**	Olešna
2017	**Python Brewery**	The village of Rosice
2017	**Brewery Dude**	Prague
2017	**Hustopeÿský brewery**	Hustopece nad Becvou
2018	**Slepice Brewery**	Prague
2018	**Farmer's brewery Na Gruntÿ**	Vranov near Brno
2018	**Petr Petruzálek Brewery**	Merklín u Pÿeštice
2018	**MØK Brewery**	Brno
2018	**Flying Ram Brewery**	White-Lawn
2018	**Brew Team Prague**	Prague
2018	**Flying brewery Ugart**	Jevisovice
2018	**Beer Mustache**	Prague
2018	**Red Squirrel Brewery**	Lathe

Source: *https:// ceskepivo-ceskezlato.cz/*

Národní
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MICROBREWERIES AND CRAFT BREWERIES

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Beer can be perceived from many perspectives. It is most often perceived as a weakly alcoholic beverage, but it can also be perceived as a cultural, economic and social phenomenon. Following the latter aspect, beer has undergone a very turbulent development and with the advent of the industrial revolution and globalization, this beverage began to move away from consumers somewhat, the brewing market became extremely concentrated, production became cheaper due to the liberalization of business, and the often neutral-tasting pale lager spread massively. But many consumers did not identify with this. Why was this so? Why do microbreweries and craft breweries in the USA often come up with the most unusual innovations? Why has Japan never known anything other than bottom-fermented lager in history? Why does the Czech Republic occupy the first place in terms of breweries per million inhabitants? How does the microbrewery and craft brewery segment actually function economically, when traditional breweries have a natural cost advantage resulting from their size? Who were the f Why are German brewers so conservative, while their Belgian colleagues routinely use less common ingredients in their beer brewing? This publication seeks to answer all these questions and many others.

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