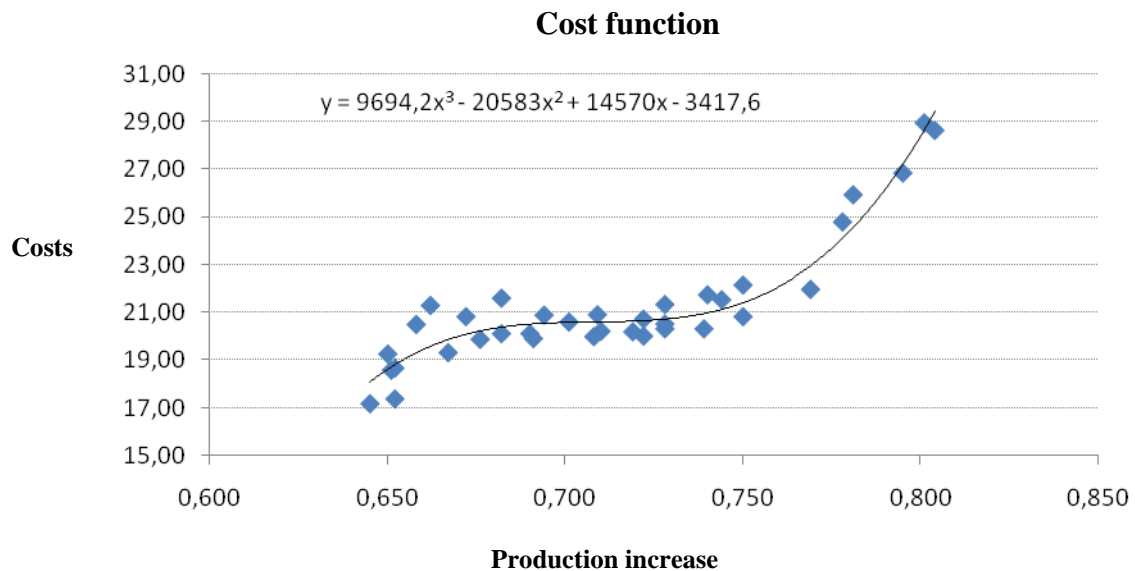# Seminar 11

Cost function

Exercises

1. Nonlinear cost function was estimated based on the data (see extra file with data set) in the following general form:

$$y = a + bx + cx^2 + dx^3$$

This function was employed to describe the relationship between production increase and feed consumption (y = *costs in CZK/day, x = production increase in kg/day*).

Cost function

$$y = 9694{,}2x^3 - 20583x^2 + 14570x - 3417{,}6$$

Costs (vertical axis)

Production increase (horizontal axis)

2. Calculate cost per day for the production increase 0,665 kg and 0,775 kg.

3. Write average cost function (AC).

4. Write marginal cost function (MC).

5. Draw AC and MC function into the graph in connection with the cost function.

TC │
   │
   │
   │
   │
   │
   │
   └──────────────────────────── y

AC │
MC │
   │
   │
   │
   │
   │
   │
   └──────────────────────────── y

6. Write the mathematical formula for the calculation of the point of the maximal average costs. Find this point also graphically, with the help of the following table.

AC │
MC │
   │
   │
   │
   │
   └────────────────────────
        Production increase
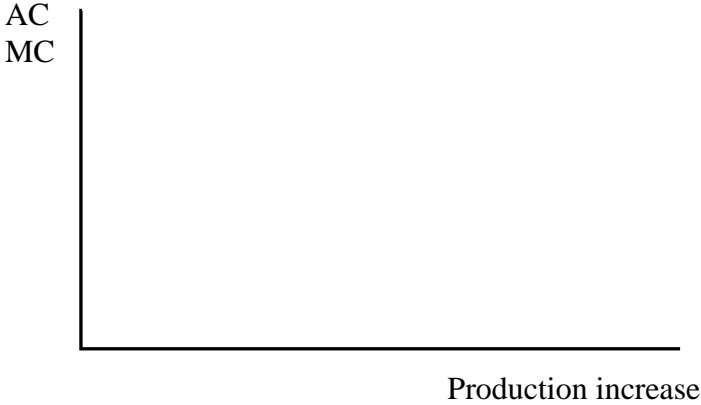
Production increase	AC	MC
0,68	29,88	21,22
0,68	29,88	21,22
0,69	29,72	11,10
0,69	29,69	10,10
0,69	29,60	7,43
0,70	29,35	3,26
0,71	29,09	1,94
0,71	29,05	1,98
0,71	29,01	2,08
0,72	28,69	5,62
0,72	28,60	7,84
0,73	28,45	13,86
0,74	28,35	30,34
0,74	28,35	32,18
0,74	28,39	40,15
0,75	28,54	53,85
0,77	29,83	111,04
0,78	30,96	145,46

7. Calculate the production increase to reach the maximal profit if the price of the pork meet is 39 CZK/kg.

8. Calculate the change of the production if the pork meet price increases from 39 CZK/kg to 45 CZK/kg.

9. Calculate supply elasticity in this interval.

10. Average fixed costs are 7,45 CZK/day. Calculate their share of the total costs in case of the production increase 0,6 kg/day and 0,7 kg/day.

Individual exercise

Based on general running of average and marginal costs in short-term and long-term period determine the difference between supply function in short-term and long-term period. Draw these functions into the graph.