Profitability of dairy and suckler cows breeding on Czech farms

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Abstract: The EU Common Agricultural Policy enables to provide coupled payments for cattle breeding. The article compares the profitability in dairy cows and suckler cows breeding under the Czech agricultural policy and market conditions. It is approved that particularly very large farms with an extensive suckler cows breeding on permanent grassland are over-supported and realize rents. Based on the analytical results, suggestions to distribute the supports more effectively and fairly, particularly those under the Council Regulation (EC) No. 73/2009, Article 68, are presented.

Key words: Czech agricultural policy, profitability, dairy cows, suckler cows, permanent grassland

The cattle breeding represents one of the most important sectors in the Czech agriculture (permanent cash flows for farms, employment, maintenance of soil quality, etc.). The importance of the sector is seen particularly in the marginal areas (Less Favoured Areas – LFA). That is why, in spite of a continuous shifts of direct supports of the EU Common Agricultural Policy (CAP) from coupled to decoupled forms, the cattle breeding preserves privileges to be partly supported by the coupled payments, e.g. under the Council Regulation (EC) No. 73/2009, Article 68 (further only Art. 68).

There is a question in the Czech Republic, how to distribute effectively the coupled and other payments among different categories of cattle breeding, considering their real economy especially after the EU accession. The categories (technologies) and their practical importance in the Czech agriculture are as follows:

– *Intensive breeding of dairy cows (ID)* and milk production with feedstuff resources prevailingly on arable land. The technology, even in the Less Favoured Areas (LFA), utterly dominates with about 99% of the dairy cows herds.
– *Pasture (extensive) breeding of dairy cows (ED)* and milk production with feedstuff resources prevailingly on the permanent grassland (further only grassland), mainly located in the LFAs. The technology, which is common in marginal regions in the EU 15 countries, represents a minority with about 1% of the dairy cows herds.
– *Intensive breeding of suckler cows (IM),* characterised by more than 0.5 suckler cows/ha of fodder crops, with feedstuff resources on grassland in the LFAs and/or on arable land. The technology is also marginal, with about 10% of the suckler cow herds.
– *Extensive breeding of suckler cows (EM),* characterised up to 0.5 suckler cows/ha of fodder crops, mainly grassland in the LFAs. This "ranch" technology is mostly applied at present, with about 90% of the suckler cow herds.

The allocation of cattle breeding by Czech regions and other basic characteristics (2010) are presented in Table 1.

From Table 1, it can be derived that 167.7 thousands of suckler cows represent in this category the average livestock density by about 0.2 suckler cows/ha of grassland in the LFAs. Considering all livestock, the Czech agriculture belongs to the EU countries with the lowest livestock intensity (European Commission 2009).

In spite of this fact, the livestock production receives directly or indirectly a large amount of supports. The question is, if the supports for cattle are distributed adequately across the dairy and suckler cows and across the technologies applied, with respect to the revealed profitability of the breeding, or the revealed farm economy, respectively. And if not, which policy measures shall be applied in the future to gain a higher equitability in this field.

Both questions are related especially to the profitability of farms in Czech marginal areas, which are reported e. g. in Štolbová et al. (2010) Kvapilík (2011) and Střeleček et al. (2011). The economy of cattle breeding (including suckler cows) in the EU 15 countries is reported in Deblitz et al. (1994) for the Eastern States of Germany or in Kirner (2011) for Austria. For the Mediterranean regions, the classification of cattle breeding and the economy of pasture-based livestock farming systems are presented in Bernués et al. (2011). The economy of the so-called typical

Table 1. Allocation of cattle breeding by regions (2010)*

Indicator	Production regions			CR total
	C+S	P	PO+M	
Dairy cows (%, 1000 heads)	27.9	41.4	30.7	378.4
– with 100% support under the Art. 68 (1000 heads)	–	–	–	270.4
– with 50% support under the Art. 68 (1000 heads)				99.2
Suckler cows (%, 1000 heads)	5.4	36.6	58.0	167.7
Ewes (1000 heads)	–	–	–	104
Goats (1000 heads)	–	–	–	20
LU of cattle/100 ha of fodder crops	129.9	91.9	62.3	83.7
LU of cattle/100 ha of agricultural land	17.1	36.9	40.2	29.6
Acreage of grassland (1000 ha)	84	358	516	958
– of which grassland in the LFA (1000 ha)	17	302	512	830
Share of grassland in agricultural land (%)	5.9	27.7	62.5	27.1

*Acreages related to the land registration eligible for supports (LPIS)

Region C+S = corn and sugar beet production region = region mainly out of LFA
Region P = potatoes production region = region mainly LFA-other
Region PO+M = potatoes-oats and mountain production region = region mainly LFA-mountain
LU = livestock unit

Source: SAIF, FADN 2009 and the Report on the Czech Agriculture for 2010

dairy and beef farms, including Czech farms, is in long-run monitored and analysed in the international networks, published for the dairy sector 2009 in Hemme et al. (2010) and for the beef sector 2008 in Deblitz et al. (2009). The economy of Czech dairy farms was presented in Foltýn et al. (2008) and in Doucha and Foltýn (2009). Effects of the EU policy on dairy farming in the Dutch agriculture, as an example of policy impacts on intensive agriculture, are described in Ooms et al. (2005) and in more general approach e.g. in Ioannidis (1985).

METHODOLOGY AND DATA SOURCES

There are more methods how to measure and assess the effectiveness and profitability of the livestock production. On the farm level, it is e. g. modelling approach described in Balmann (1997). More research in this field was done using the stochastic frontier methods for the measurement and assessment of the technical (and scale) efficiency in agriculture, e.g. in Bravo-Ureta and Rieger (1991), Battese and Coelli (1995), Demircan et al. (2010) and in Rasmussen (2010).

However, the multifunctional roles and joining in the production of private and public goods in cattle breeding have to be considered. It is expressed e. g. in Havlik et al. (2005) and Doucha (2009). The multifunctionality can be generated by the stimulative and/or by the regulative (restrictive) policy measures with costs effects (Komen and Peerlings 1989; Valeeva et al. 2006).

Considering the referred results and approaches, a simpler approach is presented in this article, as follows. At the same time, the technological parameters in cattle breeding, used in the methodology, are reported e. g. in Kvapilík and Zahrádková (2007) and Řehout et al. (2009).

For the assessment of the profitability related to 1 litre of milk in the dairy cows breeding, or to 1 kg lwe (live weight) of young cattle in the suckler cows breeding, the following methods and data are used:

Physical indicators as the Czech averages[1]

(a) The average acreage of grassland required to feed 1 suckler cow is defined on the level of 2.20 ha[2]. The acreage is derived from the following indicators:

[1]Presented values of the indicators are derived from the IAEI costs surveys and from the personal consultations with the AGROKONZULTA Žamberk.

[2]Before the EU accession, this area was assessed on about 1.5 ha. After the EU accession, the implementation of various agro-environmental schemes on grassland under the Rural Development Programme (Axis 2) has issued both

– yields/ha (in green biomass) 15 t for meadows and 10 t for pastures, the nutrition value of grass and daily consumption of dry grass 10.5 kg/LU with the pasture period 200 days/year,
– birth-rate 80% of reared young animals (calves),
– ratio of 1 suckler cow equals 1.52 LU in the structure: 1.20 LU on cow with 700 kg lwe, 0.14 LU on heifers for reproduction (0.2 months/year × 0.7 LU), 0.14 LU on other young animals (7/12 months/year × 0.3 LU × 80% birth-rate), 0.04 LU on bull[3].

(b) Annual production:
– for dairy cows: milk yields for 2004–2010 based on the Czech Statistical Office and econometric extrapolations combined with expert assessments for 2011–2013,
– for suckler cows: 250 kg lwe of young cattle; with the consideration of the birth-rate 80% it represents net 200 kg lwe[4].

Definition of profitability

P1 – profitability without supports: (FGP/C) × 100 – 100 (FGP = unit farm gate prices; C = unit costs of production)

P2 – profitability with direct supports and feed supports: (FGP + direct supports + feed supports/C) × 100 – 100

P3 – total profitability (of suckler cows breeding) including area supports linked with an "excessive" acreage of grassland[5]: (FGP + all supports)/N × 100 – 100

Definition and level of supports and their impact on profitability and farm economy

(a) The real level of payments in the period of 2004 to 2010 under the SAPS, the TOP-UP, the national and the LFA schemes and under the Art. 68 (it means including national supports for dairy cows in 2010 and 2011). The list of applied supports including their effects on the economy of cattle breeding is presented in Table 2[6].

(b) For 2011 and 2012, there is a presumption that the needed national financial sources will be available and the 2011 system of the distribution of the "TOP-UP" supports between dairy and suckler cows will not be changed in 2012. The distribution of supports under the Art. 68 on the sectors for 2012–2 013 are presented in Table 3.

(c) Direct supports are converted per 1 litre of milk using the average milk yield of the given year, or per 1 kg lwe of sold young cattle per year.

(d) Area payments are projected as feed supports (FS) through the acreage of fodder crops to cover the nutrition of 1 LU of ruminants (including supports for cereals in grain feeds) as follows:

$$FS = (AP \times a)/P$$

where:
FS = feed support/production unit (1 litre of milk; or 1 kg lwe of young animals, respectively)
AP = (SAPS + TOP-UP per agricultural land + LFA payments) per 1 ha
a = acreage of fodder crops required to feed 1 cow
P = production of milk/beef per 1 cow

Note that the LFA supports in the Czech Republic are paid only on the grassland under the density limits 0.2 LU/ha of fodder crops at the minimum and 1.4 LU/ha of agricultural land at the maximum. Above it, all mentioned supports are subdued to the *cross compliance* conditions, including the Good Agricultural and Environmental Conditions (GAEC).

(e) There are different effects of the area supports between intensive and extensive technologies:
– In the (intensive) dairy cows breeding and in the suckler breeding with more than 0.5 LU/ha of fodder crops, a rough accordance between the livestock density and the acreage of fodder crops on farms is supposed. The area supports are fully projected in the reduction of feed costs.

in a lower yields of grassland and a lower nutrition quality of fodder. On typical farms in the AGRIBENCHMARK network (Deblitz et al. 2009), the acreage of fodder crops to feed 1 cow ranges from about 1.0 to 1.2 ha (Great Britain, Germany, Austria) up to 6.1 ha (Australia) and even to about 17 ha (USA). On the Czech farm, the acreage is 1.85 ha.

[3]In other way: 1 LU in the suckler cow breeding consists of 0.790 LU of cow, 0.092 LU of heifers for reproduction, 0.092 LU of other young animals and 0.026 LU of bull.

[4]The meat production of the rejected cows is projected in the earnings reducing their purchase costs and therefore the level of their depreciation.

[5]The explanation of the "excessive" acreage of grassland: see the next part, point (e).

[6]Agro-environmental payments (especially the payments for the maintenance of grassland and for organic farming) are not considered. It is supposed that the payments just compensate lower yields/higher costs for environmental services. However, on many farms these payments create a real complement to direct payments (e. g. by the sell of biomass), or the increased costs are compensated by higher prices for bio-products, respectively. The excess supports in that case are not considered in the calculation of profitability of the final products, but they influence the total farm economy.

Table 2. Supports for cattle (2010) and their influence on the economy of breeding

Support	Rates of supports	Effects on breeding
SAPS	4060.60 CZK/ha of a. l.	reduction of costs on feeds
"Green oil"	about 470 CZK/ha of a. l.	reduction of costs on energy
Supports of dairy cows	100% support: 2444.40 CZK/LU of dairy cows, Ø 2077 CZK/LU	direct increase of incomes
TOP-UP on agricultural land	514.10 CZK/ha of a. l.	reduction of costs on feeds
TOP-UP on ruminants	1310.10 CZK/LU	direct increase of incomes
Supports of suckler cows	2119.60 CZK/LU	direct increase of incomes
LFA payments (M = mountain; O = other; S = specific LFA)	MA: 4127 CZK/ha of gl. MB: 3522 CZK/ha of gl. OA: 3075 CZK/ha of gl. OB: 2471 CZK/ha of gl. S: 2997 CZK/ha of gl. SX: 2392 CZK/ha of gl. average: 3363 CZK/ha of gl.	reduction of costs on feeds

a. l. = agricultural land; gl. = grassland

Source: Report on the Czech Agriculture 2010

– In the extensive suckler cows breeding with less then 0.5 LU/ha of fodder crops, only a part of the acreage of grassland on farms is utilised as forage and the remaining part of the "excessive" acreage is not being used (fully) as forage[7]. The area supports on this acreage are in reality a payment for a by-product of beef production as the "maintenance of landscape", being subdued – contrary to other agro-environmental payments – only to the *cross compliance* requirements. These supports are projected in the total profitability of the breeding[8].
– Area supports (AS) on the "excessive" acreage are converted in the profitability of suckler cows (1 kg lwe of young animals) as follows:

$$AS = ((AP - C) \times b))/P$$

Table 3. Distribution of supports under the Art. 68 into the individual sectors

Sector	Share%	Mil. €	Mil. CZK	Unit	Numbers	CZK/unit	€/unit
Dairy cows	59.33	18.882	462.617	LU	375 530	1 231.91	50.28
Beef	27.83	8.857	217.001	calf	116 000	1 870.69	76.35
Suckler cows				LU	176 192	1 231.61	50.27
Sheep/goats	4.50	1.432	35.088	LU	28 455	1 233.11	50.33
Hops	2.65	0.843	20.663	ha	5 200	3 973.65	162.19
Starch	5.69	1.811	44.367	ha	5 000	8 873.39	362.18
Total	100.00	31.826	779.736	–	–	–	–

Source: Ministry of Agriculture CR

[7]It is, of course, the consequence of a rational (but not necessary economically "optimum") behaviour of farms under the given conditions of the applied agricultural policy. The choice of farms is to reduce the intensity of production of private goods to the benefit of a (potentially) higher production of public goods. There is only a question, whether the "prices" of public goods are adequate to their quantity and quality.

[8]The average level of the area supports (2010) ranges from CZK 6600/ha to CZK 8400/ha of fodder crops (according to the LFA categories) and the costs on the maintenance of grassland of about CZK 3500–4000/ha of fodder crops make this "service" a highly profitable activity, significantly improving the total profitability of the extensive technologies. As in the case of agro-environmental schemes, surpluses of grass can be sold on markets, thus improving the farm economy (e.g. hay or biomass to bio-gas stations).

Table 4. Utilisation of grassland in LFAs (2010)

Indicator	LU of all ruminants/ha of grassland				
	to 0.2	0.21–0.5	0.51–0.8	above 0.8	total
LFA total (1000 ha)					830
share in the total acreage of grassland (%)	5.3	32.1	23.4	39.2	100.0
Ø acreage of grassland/farm (ha)	11.0	60.9	44.6	50.5	43.4
LFA – mountain (1000 ha)					372
share in the total acreage of grassland (%)	4.5	38.7	29.7	27.1	100.0
Ø acreage of grassland/farm (ha)	10.6	53.2	40.3	39.8	38.9
LFA – other (1000 ha)					319
share in the total acreage of grassland (%)	5.5	18.4	17.9	58.1	100.0
Ø acreage of grassland/farm (ha)	10.7	58.0	50.8	57.3	45.4
LFA – specific (1000 ha)					139
share in the total acreage of grassland (%)	6.5	48.2	20.8	24.5	100.0
Ø acreage of grassland/farm (ha)	12.9	93.2	51.9	54.6	53.4

Source: own IAEI calculations based on the SAIF data

where:

C = costs/ha on maintenance of grassland (CZK 3700 in average)

b = (1 – (number of suckler cows/ha of grassland × 2.2 ha as the average acreage of grassland required to feed 1 cow) = "excessive" part from 1 ha of grassland not being (fully) used as forage

– Because of the prevailing extensive technologies in the Czech agriculture, the acreage of the "excessive" grassland amounts to thousands of hectares. For an approximate illustration, the distribution of the acreage of grassland in the LFAs according to the individual LFA categories and to the livestock density is shown in Table 4.

– Supposing that the majority of cattle in the LFA – mountain regions is linked with the suckler cows breeding, Figure 1 illustrates for the regions the approximate relations between the livestock density and the "excessive" acreage of grassland, supported purely as the "maintenance of landscape". The density higher than 0.5 LU/ha of grassland considering the average

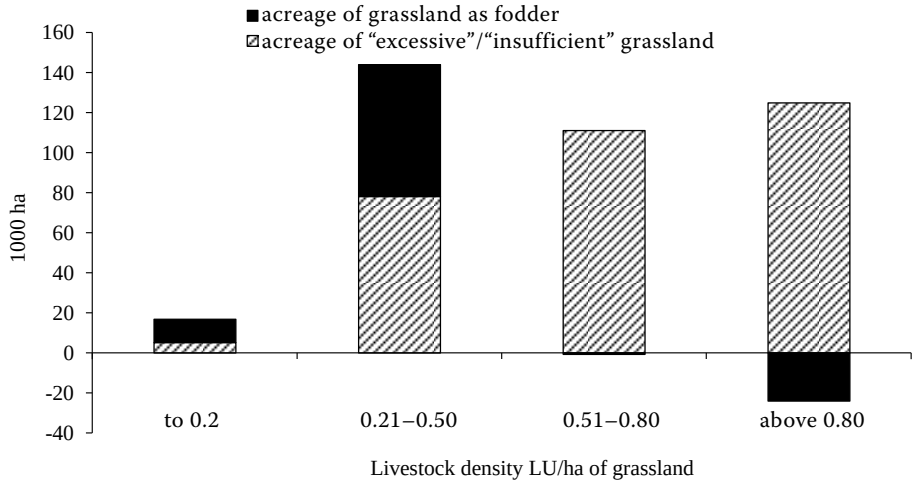

Figure 1. Distribution of grassland in the LFA – mountain regions to the acreage of forage and to the acreage of the "excessive"/"insufficient" grassland depending on the livestock density

Source: own IAEI calculations based on the SAIF data

yields of grassland can lead to a demand for a higher crop intensity or for fodder crops on arable land or for purchases of fodder.

Farm-gate prices and costs

(a) Costs of milk and beef production[9] are based on the IAEI surveys 2004–2009. Costs for 2010–2013 are simulated using the IAEI model "RENT-4" and expert assessments. The "Green oil" supports reduce the total costs on fuel.
(b) Farm-gate prices (FGP) of milk and beef for 2004–2010 are based on the data of the Czech Statistical Office and the Ministry of Agriculture. The prices for 2011–2013 are simulated using the IAEI model "RENT-4" and the expert assessments.

Profitability of milk and beef production is compared with the total economic results of farms specialised on the milk production and on the suckler cows breeding, using the FADN data for 2004–2009. The main indicator for the assessment of farm economy is represented by the net value added (including supports, without production taxes) per 1 agricultural working unit (NVA/AWU; 1 AWU = 2200 hours/year).

It is useful to note that all physical and economic indicators represent the Czech averages, with large variations on the individual farms. For example, many farms export directly their production to be processed abroad with farm-gate prices usually much higher than the registered domestic farm-gate prices.[10]

RESULTS

The results concern the prevailing technologies in cattle breeding, that is the intensive milk production (ID) and the extensive suckler cows breeding (EM).

Dairy cows and milk production

The number of dairy cows has been significantly reduced after the EU accession. During the first years, it has been especially due to the increasing milk yields under the applied quota system. During the last three years, it has been influenced by the decreasing profitability, particularly in 2009 during an extreme decline of the FGP of milk. To maintain the herds of dairy cows, the Ministry of Agriculture decided to utilise the supports under the Art. 68 in 2010 and 2011. This decision together with the increase of in 2010 and 2011 FGP of milk since 2010 has issued in an important increase of profitability (by 21% compared with 2009). Under the given suppositions, the total profitability including feed supports (P2) of milk production could be relatively high also in 2011–2013, on the level of about 10% and more (Table 5).

The time development in the profitability P1 and P2 illustrates a higher income risks in the dairy sector caused mainly by a higher FGP volatility. However, the average figures hide a broad range of profitability among Czech farms. For example, in 2009 the average costs of milk production on the level of CZK 8.10 per litre were monitored only on 19.3% of the surveyed farms, 17.5% of the farms showed lower costs, but 63.2% of the

Table 5. Profitability of dairy cows and milk production 2004–2013

Indicator	Unit	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Milk yield	l/year	5912	6127	6370	6548	6776	6870	6904	7160	7240	7320
Total costs	CZK/l	8.17	8.3	8.07	8.66	8.8	8.1	8	8.03	8.43	8.43
FGP	CZK/l	8.06	8.28	7.81	8.36	8.45	6.14	7.42	8.16	8.16	8.16
Total supports	CZK/head	4256	6641	8056	7956	6654	7112	6 63	6313	6851	6993
– under Art. 68	CZK/head	x	x	x	x	x	x	2444	2444	1223	1223
Total supports	CZK/l	0.72	1.08	1.26	1.22	0.98	1.04	0.98	0.88	0.95	0.96
Profitability P1	%	–1.4	–0.3	–3.3	–3.5	–4	–24.2	–7.2	1.6	–3.2	–2.8
Profitability P2	%	7.5	12.8	12.4	10.6	7.2	–11.5	9.5	16.8	10.0	10.5

Source: own IAEI calculations, the IAEI costs surveys 2004–2009

[9]In the suckler cow breeding, the real costs cover also the costs on the reproduction (on heifers).
[10]Lower levels of the domestic FGP are given by the domestic supply/demand relations and also by a lower effectiveness of the domestic food industry.

farms had higher costs, of which one third produced milk with costs of about CZK 10 per litre and more.

Suckler cows

The number of suckler cows has been permanently growing, particularly after in 2010 and 2011 EU accession. It is evidently the consequence of a positive development of their profitability and of the total economy of the farms in question.

As presented in part 1, the unit profitability significantly depends on the livestock density. The majority of suckler cows are extensively bred in the LFAs (in the potatoes-oats and hilly production regions under the Czech regional classification) on grassland, with a very low livestock density and with a higher participation in the agro-environmental schemes (maintenance of grassland, organic farming). The dependence of the profitability on the livestock density is demonstrated for the years 2009 and 2013 (prediction) in Table 6[11].

Table 6. Dependence of profitability of suckler cows breeding on the livestock density[1]

Indicator	Unit	Livestock density: the number of suckler cows/ha of grassland							
		0.2		0.3		0.4		0.5	
		P	Po+H	P	Po+H	P	Po+H	P	Po+H
2009									
Costs[2]	CZK/kg lwe	107.5	123.5	107.5	123.5	107.5	123.5	107.5	123.5
FGP	CZK/kg lwe	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9
Total supports	CZK/kg lwe	115.9	156.4	96.3	122.0	86.5	104.8	83.0	98.6
– direct supports including Art. 68	CZK/kg lwe	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
– feed supports	CZK/kg lwe	62.3	77.9	62.3	77.9	62.3	77.9	62.3	77.9
– supports for "maintenance of landscape"	CZK/kg lwe	32.9	57.8	13.3	23.4	3.5	6.2	0.0	0.0
P1 – Profitability without supports	%	–48.9	–55.5	–48.9	–55.5	–48.9	–55.5	–48.9	–55.5
P2 – Profitability with direct and feed supports	%	28.3	24.3	28.3	24.3	28.3	24.3	28.3	24.3
P3 – Total profitability[3]	%	58.9	71.1	40.7	43.2	31.5	29.3	28.3	24.3
2013									
Costs[2]	CZK/kg lwe	117.8	125.4	117.8	125.4	117.8	125.4	117.8	125.4
FGP	CZK/kg lwe	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0
Total supports	CZK/kg lwe	127.5	158.1	96.2	117.8	80.5	97.7	74.9	90.5
– direct supports including Art. 68	CZK/kg lwe	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
– feed supports	CZK/kg lwe	70.0	85.6	70.0	85.6	70.0	85.6	70.0	85.6
– supports for "maintenance of landscape"	CZK/kg lwe	52.6	67.6	21.3	27.3	5.6	7.2	0.0	0.0
P1 – Profitability without supports	%	–51.6	–54.5	–51.6	–54.5	–51.6	–54.5	–51.6	–54.5
P2 – Profitability with direct and feed supports	%	12.0	17.6	12.0	17.6	12.0	17.6	12.0	17.6
P3 – Total profitability[3]	%	56.6	71.5	30.1	39.4	16.7	23.4	12.0	17.6
P3 – index 2013/2009	index	96.2	100.6	73.9	91.1	53.0	79.7	42.3	72.6

[1]Potatoe production region (P) and Potatoes-oats and hilly region (Po+H)

[2]Considering the constant level of unit costs. However, the costs in lower livestock densities (especially due to constant fixed costs e. g. for fencing) can be higher than presented.

[3]Considering the profitability of "maintenance of landscape" for "excessive" acreage of grassland

Source: own IAEI calculations, the IAEI costs surveys 2004–2009

[11]Note that the minimum livestock density for the LFA and agro-environmental payments is 0.2 LU/ha of fodder crops, which represents about 0.13–0.14 cows/ha of fodder crops.

Table 7. Profitability of suckler cows breeding

Indicator	Unit	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Costs	CZK/kg lwe	92.7	93.5	114.8	107.1	112.5	115.8	111.8	116.1	121.1	124.0
FGP	CZK/kg lwe	57.9	67.3	64.7	58.7	52.3	54.9	58.1	57.0	57.0	57.0
Total supports	CZK/kg lwe	95.4	104.6	113.3	105.7	105.4	116.8	105.4	107.9	117.3	122.9
– direct supports	CZK/kg lwe	21.3	10.4	13.4	13.3	20.4	20.7	15.3	10.5	10.5	4.9
– feed supports	CZK/kg lwe	49.5	59.5	62.4	58.9	57.0	61.3	58.4	59.6	63.7	69.0
– supports on "maintenance of landscape"	CZK/kg lwe	24.6	34.7	37.5	33.5	28.0	34.8	31.7	37.8	43.1	49.0
P1 – Profitability without supports	%	–37.5	–28.0	–43.6	–45.2	–53.5	–52.6	–48.0	–50.9	–52.9	–54.0
P2 – Profitability with direct and feed supports	%	38.9	46.7	22.4	22.2	15.3	18.2	17.9	9.5	8.3	5.5
P3 – Total profitability*	%	65.4	83.9	55.1	53.5	40.2	48.3	46.2	42.0	43.9	45.1

*0.2 cows/ha of grassland

Source: own IAEI calculations, the IAEI costs surveys 2004–2009

It is evident from Table 6 that the lower the livestock density, the higher the area supports linked with the "excessive" acreage of grassland. Particularly these supports cause a high total profitability of suckler cows, even though the profitability after 2009 can have a declining tendency (especially for higher livestock densities – see the predictions in Table 6). An "excessive" acreage of grassland and the linked supports for the "maintenance of landscape" shall be eliminated in the livestock densities above 0.5 cows per ha of grassland.

The development of the average profitability of the suckler cow breeding in 2004–2013, based on the normative evaluation of the needed and "excessive" acreage of grassland is presented in Table 7.

The transfer of supports from suckler cows to dairy cows has issued after 2005 in the decreasing profitability of suckler cows. However, the profitability with the inclusion of feed supports (P2), and particularly considering the payments for the "maintenance of landscape" in the "excessive" acreage of grassland (P3), has been permanently very high and relatively stable, compared with the profitability of milk production. This is due to the long term defined rates of supports, continuing also in the period after 2011. Compared with the dairy cows breeding, a higher stability of the profitability in the suckler cow breeding is evident. However, the dispersion of costs on the surveyed farms is much higher in the suckler cows breeding (Figure 2).

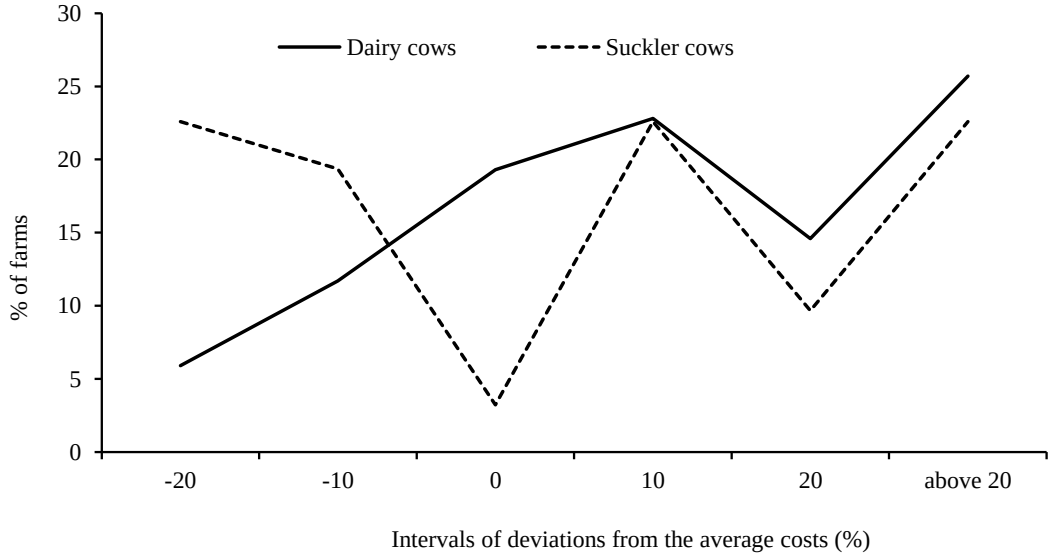

Figure 2. Distribution of costs levels on the surveyed farms

Source: own IAEI calculations based on the SAIF data

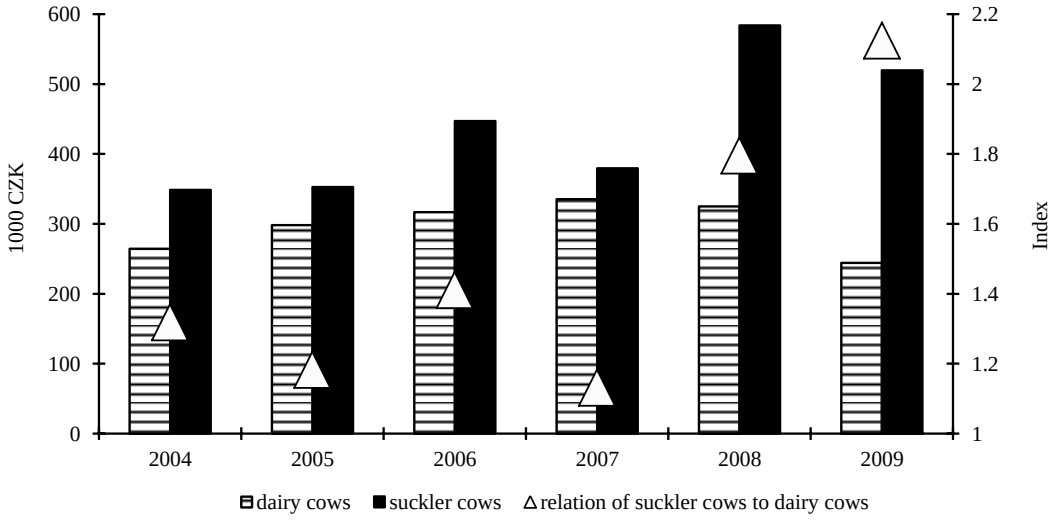

Figure 3. Comparison of NVA/AWU between farms specialised on milk production and on suckler cows breeding

Economy of farms specialised on milk production and on suckler cows breeding

The comparison of economy of farms specialised on milk production and on suckler cows breeding, based on the FADN data 2004–2009, is shown in Table 8.

The main criterion for the comparison of farm economy represents the level of the net value added (including supports) per 1 AWU (NVA/AWU). The comparison based on this indicator is illustrated on Figure 3.

It is evident that the farms specialised on the suckler cows breeding have been in the long run realising a much higher level of the NVA/AWU than the farms specialised on milk production. In the last years, the difference is nearly twofold. The differences in the total economy to a large extent correspond with the differences in the total profitability (P3) of both categories of cattle. They reflect different labour costs (the number of AWU/100 ha of agricultural land in the milk production ranges between 3.9 and 4.4, compared with 1.4–1.6 in the case of suckler cows) and supports on the "excessive" grassland for the "maintenance of landscape" in the suckler cows breeding. Above it, this breeding much more utilises additional payments for other agro-environmental services.

DISCUSSION AND CONCLUSIONS

Under the specific Czech conditions and to the contrary of findings in other EU countries (see e.g. Bernués et al. 2011), a low-input cattle breeding in the LFAs is extremely profitable in general, showing a overcompensation for public goods provided (Doucha 2008). Considering the presented results and the objective allocation of future supports for cattle (especially of those under Art. 68), Czech policy makers shall be oriented on the following goals:

(a) To increase the total profitability in the milk production in the current intensive breeding with the fodder crops prevailingly on arable land.
(b) To increase the number of dairy cows with the extensive milk production in the LFAs, with the fodder crops prevailingly on grassland.
(c) To reduce the differences in the farm economy between the farms oriented on milk production and the farms oriented on suckler cows breeding.
(d) To reduce the (politically and economically) unsubstantiated differences in the farm economy between the technologies with a low and a higher livestock density, also with the aim to increase the number of cattle and therefore the employment in the marginal areas;
(e) To mitigate higher income risks in the dairy cows breeding.

Under the already done governmental decisions (particularly related to Art. 68), the mentioned goals can be reached *inter alia* by the following additional measures:

(a) To reduce the economically, socially and environmentally unsubstantiated high profitability (or the high level of NVA/AWU) in the extensive breeding of suckler cows, applying a differentiation of payments under the Art. 68 depending on the livestock density (in the sense: the higher density,

Table 8. Profitability of average farms 2004–2009

Indicator	Unit	2004	2005	2006	2007	2008	2009
Farm specialised on milk production							
Acreage of agricultural land	ha	206.5	184.9	188.3	182.0	209.6	204.0
Share of grassland in agricultural land	%	62.0	63.7	61.3	57.8	58.1	57.5
Share of agricultural land in LFA	%	92.7	86.4	86.7	86.6	80.9	81.6
Number of LU of cattle/100 ha of agricultural land	LU	58	63	62	64	64	65
– dairy cows/100 ha of agricultural land	LU	37	37	37	37	38	37
– suckler cows/100 ha of agricultural land	LU	2	1	2	2	2	3
Number of LU of cattle/100 ha of fodder crops	LU	75	81	81	86	86	89
– dairy cows/100 ha of fodder crops	LU	47	48	48	50	51	51
– suckler cows/100 ha of fodder crops	LU	2	2	2	3	3	4
Number of AWU/100 ha of agricultural land	AWU	4.4	3.9	4.0	4.0	4.1	4.2
Total production	1000 CZK/ha	30.4	29.1	28.8	32.5	34.0	28.5
– share of livestock production	%	64.1	72.9	70.5	68.9	67.4	66.3
Share of intermediate consumption in production	%	73.4	74.6	77.1	74.8	77.9	83.9
Total costs*	1000 CZK/ha	34.4	34.4	35.2	39.0	42.3	39.0
Total supports	CZK/ha	6 290	7 827	9 500	9 783	10 303	10 115
Net value added/ha of agricultural land	1000 CZK	11.6	11.6	12.5	13.5	13.4	10.3
Net value added/AWU	1000 CZK	264.6	298.3	316.8	335.6	325.1	244.5
Production/costs	CZK	0.88	0.85	0.82	0.83	0.80	0.73
(Production + supports)/costs	CZK	1.07	1.07	1.09	1.08	1.05	0.99
Farm specialised on suckler cows breeding							
Acreage of agricultural land	ha	191.1	202.4	194.4	165.4	167.4	193.9
Share of grassland in agricultural land	%	95.0	94.7	93.3	95.6	94.3	95.6
Share of agricultural land in LFA	%	91.5	97.1	93.8	93.1	90.8	94.8
Number of LU of cattle/100 ha of agricultural land	LU	32	35	37	37	37	35
– dairy cows/100 ha of agricultural land	LU	0	0	0	0	0	0
– suckler cows/100 ha of agricultural land	LU	25	25	26	27	26	25
Number of LU of cattle/100 ha of fodder crops	LU	33	36	38	38	38	36
– dairy cows/100 ha of fodder crops	LU	0	0	0	0	0	0
– suckler cows/100 ha of fodder crops	LU	25	26	27	27	27	25
Number of AWU/100 ha of agricultural land	AWU	1.4	1.4	1.5	1.5	1.6	1.5
Total production	1000 CZK/ha	7.0	8.0	7.8	8.6	8.4	9.1
– share of livestock production	%	38.6	43.8	46.2	43.0	45.2	48.4
Share of intermediate consumption in production	%	110.0	112.5	133.3	127.9	129.8	124.2
Total costs*	1000 CZK/ha	11.6	14.5	16.6	17.8	18.1	18.6
Total supports	CZK/ha	6 472	7 867	11 207	10 611	13 863	12 625
Net value added/ha of agricultural land	1000 CZK	4.8	5.1	6.7	5.8	9.1	7.9
Net value added/AWU	1000 CZK	348.8	352.7	446.9	379.7	583.7	519.5
Production/costs	CZK	0.60	0.55	0.47	0.48	0.46	0.49
(Production + supports)/costs	CZK	1.16	1.09	1.15	1.08	1.23	1.17
Relation NVA/AWU to farms with milk production	%	131.8	118.2	141.1	113.1	179.5	212.5

*Including unpaid labour valued at the level of average labour costs for hired workers

Source: FADN 2004–2009

the higher payments), using the total financial envelope of the given supports.

(b) To differentiate supports for dairy cows under the Art. 68, e.g. higher supports for the milk production in the LFAs with prevailing grassland as fodder crops.

In the future (in the framework of the CAP after 2013), it is useful to apply a degressivity in the LFA payments according to the livestock density. However, these changes (together with other possible changes in the agro-environmental schemes) would require a further research and analyses.

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