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**EFFECT OF FARM SIZE CHANGES OF HUNGARIAN BEEF CATTLE  
SECTOR ON PROFITABILITY, WITH SPECIAL REGARD  
TO HUNGARIAN NATIVE SPECIES**

*EFEKTY ZMIAN WIELKOŚCI GOSPODARSTW SPECJALIZUJĄCYCH SIĘ  
W CHOWIE BYDŁA NA WĘGRZECH NA ICH RENTOWNOŚĆ,  
ZE SZCZEGÓLNYM UWZGLĘDNIENIEM CHOWU  
RODZIMYCH RAS WĘGIERSKICH*

**Key words:** ESU, FADN, hungarian native species, farm size

*Słowa kluczowe:* ESU, FADN, rodzime rasy węgierskie, wielkość gospodarstwa

**Abstract.** The Farm Accountancy Data Network has introduced in Hungary, like other European countries. This index uses the European Size Units (ESU) to classify the size of farm in terms according to the standard gross margin. This unit is used in the cultivation of plants as well as in animal husbandry. The aim of this study is to determine the ESU farm sizes in case of native species in the Hungarian beef cattle sector, like the Hungarian grey cattle and Hungarian buffalo. Farm sizes where independent farming is able were same determined in case of this two species. Over this size the farm can produce profit.

### Introduction

The Farm Accounting Data Network (FADN) has been working in the European Union for 40 years. This system has received also in Hungary. This system defines the sizes of each enterprise as economic

**Table 1. Distribution of agricultural farms according to ESU class sizes**

Class size	ESU	Hungary	Poland
Very small	<4	851 583	1 534 719
Small	4≤8	19 300	239 381
Medium small	8≤16	10 546	147 961
Medium large	16≤40	6 568	64 037
Large	40≤100	1669	10 615
Very large	>100	171	3486
Total		889 967	2 000 199

Source: Goraj et al. 2008, Laczka 2008.

The determination of sizes can raise a lot of problems at the input or output indexes. The input index does not take into consideration the soil quality, the real labour value and quality. The variety of weather can cause same problem at the output index.

In this study the farm size is determined by the ESU classification in case of the Hungarian grey cattle and Hungarian buffalo which are native in Hungary. However the Hungarian beef consumption is lower than the EU average the beef of unique native varieties can be in demand at special or international markets.

Two producing ways are at the beef cattle sector in Hungary: basic stock-farm and goods producing.

At the basic stock-farm animals over average value of productiveness are kept and bred. The main aim of these farms is to supply with excellent bull and cow stocks the producing farms [Petró 2005]. There are two sort of basic stock farms in Hungary [Bodó 2007]:

classes. The measure of FADN is the ESU. One ESU means 1200 Euro standard Gross Margin (SGM). All farms with at least 2 ESU can make report. The minimum thresholds are different in the EU countries. For example it is 1 ESU in Romania, 2 ESU in Hungary and in Poland, 8 ESU in Slovakia and in Austria and 16 ESU in Germany and in the United Kingdom [Community Committee 2007].

In Hungary the Research Institute of Agricultural Economics collects dates [Keszthelyi 2009]. The Hungarian threshold of farm size is very low. The table 1 shows the distribution of farms according to class sizes. You can see there are a lot of very small farm in Hungary and also in Poland .

- Species maintain stock farm: breed new supplies – own breeding, letting or sell calves. These farms are entitled to governmental financial assistances and also to the EU assistances.
- At gene reserving stock farm non profitable varieties and species are also kept. Home register is also made to note as much dates as possible. The government gives more financial assistances them because of extra costs. The keeping of non profitable varieties and species is made possible by the assistance.

Breeding organizations have been founded to carry out the duties of species maintain and gene reserving organizations in Hungary. The Hungarian Grey Cattle Breeding Organization was founded 1989. The Hungarian Buffalo Breeding Organization has temporary permit yet.

Goods can be produced by intensive or extensive technology. Commonly the beef cattle are kept extensively in Hungary because it can make the most profit at the less valuable agricultural areas. This is a typical cattle keeping technology in Hungary from little enterprises to big estates.

Intensive technology is used mainly in West-Europe. This fattening means more costs than extensive technology. The extra costs are refunded in higher prices. The intensive technology is not used in Hungary because there is a minimal market for this product and the export is not worth for the keeper and the competition in the international market is strong [Petró 2005].

The keepers carry out the animals according to the law at the goods producing farms. The owners are entitled both to subsidies in beef sector and in area utilizing. The main aim for this farms the high quality production [Bodó 2007].

The Hungarian native beef cattle species are kept in extensive circumstances in grasslands. According to the standpoint of the Hungarian Grey Cattle Breeding Organization's (HGCB) the Hungarian grey beef name can be used when the grey cattle is certificated comes from thoroughbred Hungarian grey cattle species and it is kept in extra-extensive circumstances" [HGCB 2008]. The cattle are kept in the open air, not necessary to use pen in winters but wind-sheltering zone is needed.

According to the Hungarian Buffalo Breeding Organization's (HBBO) breeding program the buffalos are kept in ex situ circumstances in the case of gene reserving and species maintain. That is means the keeping in grasslands at grazing period and used pen in winter [HBBO 2009]. *In situ* keeping is used only on goods producing farms. It means the ancient circumstances at feeding, keeping and selection [MARD decree 93/2008, VII.24].

### Model and methods

This study examines what does the ESU class sizes mean in stock unit and grassland size in the case of beef cattle keeping. The stock unit calculation is determined by the decree [MARD decree 50/2008, IV.24]:

- two years and older bulls, cows and other cattle: 1 stock unit,
- cattle from six months to two years: 0.6 stock unit,
- six months younger calves: 0.4 stock unit.

The stock units based on ESU class sizes were determined by the Microsoft Excel Solver program. Goal seeking for the maximum sizes was done to get how many stock units comes under the class sizes maximums.

According to bibliographies one bull can be calculated for every 50 cow in the case of grey cattle keeping [Bodó 2007]. This number is higher, 70 cows, in the case of buffalo keeping [Schandl 1962]. Pregnant ratio is 85%, rejected ratio is 15%. The rejected cows are supplemented from heifer breeding. The live fat stock price is 1.71 EUR/kg at grey cattle, 1.25 EUR/kg at buffalo keeping. The rejected cow price is 1.14 EUR/kg in both cases.

The lower limit of the extensification is taken into consideration at the calculation of grassland minimal size. The limit is 1,5 stock/hectare, consequently it is 0.66 hectare/stock minimal grassland [MARD decree 42/2008, IV.4]. I calculated with 1 hectare/stock because of the low quality of grasslands. Besides that the draught can more decrease the grassland stock keeping ability significant. In addition the land claim of bulls and heifers was same calculated which measure is 0.8 hectare/stock [Kovács-Mesterházy 2009]. The following parameters were taken into consideration to determine the sector assistance:

- producing cow subsidy: 120 EUR/stock [MARD decree 30/2006, IV.12, MARD decree 82/2005, IX.15],
- basic cow subsidy: 36 EUR/stock [MARD decree 29/2007, IV.20],
- extensification payment: 65 EUR/stock [MARD decree 42/2008, IV.4].

The beef cattle keeping is based on grassland. The EU and the Hungarian government give financial aids for these areas:

- unfavourable area financial aid: 85.9 EUR/hectares [EK decree 19. paragraph 1257/1999]; the measure of aid decrease with the increasing of the used grassland; to 50 hectares – 100% of the aid can be claimed, between 51 and 100 – hectares 90%, between 101 and 300 hectares – 80 %, between 301 and 500 hectares – 70% and over 500 hectares only 50% of the total aid can be claimed,
- Natura 2000 grassland aid: 40 EUR/ha,
- extensive grassland farming aid with pasturing: 77 EUR/hectares, on ecology farming 85 EUR/hectares [MARD decree 61/2009, V.14]

The calculation model is based on extensive circumstances. [Kovács 2010] Both of the two Hungarian native species are kept extensively provided cow-shed and suitable fodder at winter. The variable and fix cost as well as the producing value are determined. These dates give the net

**Table 2. ESU class sizes in the beef cattle sector in Hungary**

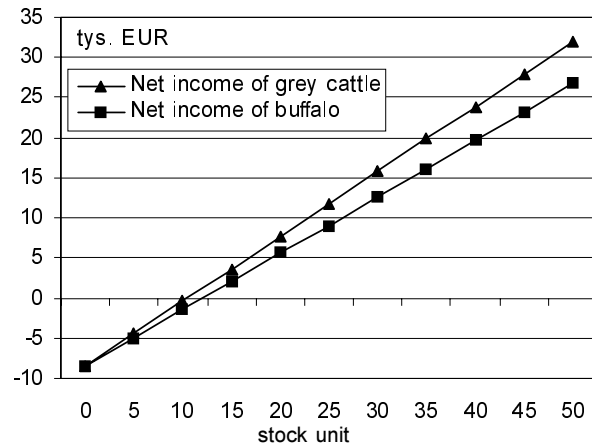
Class size	ESU	Stock unit	Grassland [ha]
Very small	<4	0-21	0-17
Small	4≤8	21.1-41.8	18-34
Medium small	8≤16	41.9-85.2	35-67
Medium large	16≤40	85.3-214.1	68-168
Large	40≤100	214.2-537.3	169-422
Very large	>100	537.4-	422-

Source: own study.

**Table 3. The class sizes maximal financial aids**

Class size	Financial aids by beef cattle [EUR]	Financial aids by grassland [EUR]	Total aids [EUR]	Specific aids [EUR/stock unit]
Very small	2 290	3 190	5 480	322
Small	5 000	6 380	11 380	335
Medium small	10 446	11 982	22 428	335
Medium large	26 634	135 233	161 867	963
Large	67 292	228 048	295 340	700

Source: own study.



**Figure 1. Net incomes at Hungarian grey cattle and Hungarian buffalo keeping**

Source: own study.

income and that minimal animal stock which can cover all the costs of the enterprises [Illés 1995]. As well as I determined the minimal farm size (in ESU and stock unit) over which the enterprise can be independently native beef keeping farm.

### Results and discussion

The ESU class sizes mean the following dimensions in the beef cattle sector in Hungary. The table 2 shows the ESU the stock units and the needed grassland in hectare of class sizes.

The European Union and the Hungarian Government give significant financial aids to the farmers. These aids can be claimed based on grassland area and the number of beef cattle. The next table shows the maximal financial aids of class sizes and specific aids. The value of specific aid is growing with the farm size expect in the large class size. The value of the specific aid is growing with the farm size but it is degressive because the degree of unfavourable area financial assistance is higher at small farms and lower at big farms proportioned a hectare.

In the follows the farm minimal sizes were determined over that the farm can deal with the keeping of the two native species independently (Fig. 1). In the case of Hungarian grey cattle keeping the minimal farm size is 11 stock units. This number is 13 stock units at Hungarian buffalo keeping. These numbers means the minimal number where the farmer can produce positive income.

The 11 stock unit means 2.35 ESU in the case of grey cattle. At the buffalo keeping the 13 stock unit means 2.59 ESU. The ESU value fall under the very small class size.

## Conclusions

The ESU class sizes means the following values in Hungarian circumstances:

- very small (<4 EUME): maximum 21 stock unit and maximum 17 ha extensive grassland,
- small (4≥8 EUME): 21.1-41.8 stock unit and 18-34 ha extensive grassland,
- lower medium (8≥16 EUME): 41.9-85.2 stock unit and 35-67 ha extensive grassland,
- upper medium (16≥40 EUME): 85.3-214.1 stock unit and 68-168 ha extensive grassland,
- large (40≥100 EUME): 2142-537.3 stock unit and 169-422 ha extensive grassland,
- extra large (>100 EUME): more than 537.4 stock unit and more than 422 ha extensive grassland.

Because of the curiosity of the Hungarian grey cattle and Hungarian buffalo beef the farmers can reach higher price. On the other hand the demand of these species is less than the demand of common beef.

The financial aids which are given by the European Union and the Hungarian Government can be claimed by every cattle keeper accordingly by the grey cattle or buffalo keepers, too. The market position of farmers gets better with these aids. The independent farm size is low. It is 11 stock unit and 2.35 ESU in the case of Hungarian grey cattle keeping and 13 stock unit and 2.59 ESU in the case of Hungarian buffalo keeping. These ESU class sizes fall under the very little class but more than 2 ESU so these farms can give data to the Research Institute of Agricultural Economics.

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- 1257/1999 EK decree, 19. paragraph.

## Streszczenie

*Celem pracy było wyodrębnienie żywotnej ekonomicznej wielkości gospodarstwa (mierzonej w ESU) specjalizującego się w chowie bydła rodzimych ras węgierskich.*

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