LIVESTOCK PRODUCTION AS ECONOMIC POTENTIAL BY REGIONS IN HUNGARY

S. Somogyi and J.B. Kliebenstein

Abstract: Many factors impact the economic environment for livestock production. Feed costs account for the largest portion of total costs for most livestock and types of livestock production operations. Corn cost is typically the dominant item. Thus, access to low cost feed can provide production cost advantages. Transportation costs also impact the competitive position of the livestock production.

The future livestock production will be impacted by many forces. The following are issues and directions the livestock industry will likely take in the future. As government, local communities and livestock producers work on identifying competitive advantages these issues will need to be addressed. An evaluation of the ability to handle these issues and the likely impacts will provide an information base for collaborative decisions and community development.

Key words: livestock, economic conditions, rural development.

Introduction

Rural development is the basic requirement not only for joining the EU but for population lifestyle quality, too. Livestock production represents an important economic component to many rural areas. It represents a very important force of economic activity, providing the opportunity for jobs and for the conversion of basic agricultural products and by-products of processing industry into higher value products. Livestock production decreased in the process of the transition, from the beginning of the nineties, but can continue to be a mainstay of economic conditions.
activity for rural areas. For some areas, it may represent the link to survival for businesses in the community. However, co-operative and integrated efforts between all stockholders in the areas will be necessary for development of a sustainable livestock production.

**Impact of livestock production on rural areas**

For rural communities livestock production represents a “value adding” industry. Examples of the “value adding” processes in milk and pork production are shown in Table 1.

**Table 1.** Economic impact of milk and pork production on Hungary (1998)

<table>
<thead>
<tr>
<th>Production item</th>
<th>Milk production</th>
<th></th>
<th>Pig production</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Head/FT.(1)</td>
<td>Hungary total/1000 FT.(2)</td>
<td>Kg weight/FT.(1)</td>
<td>Hungary total/1000 FT.(3)</td>
</tr>
<tr>
<td>Home grown feed</td>
<td>87 882</td>
<td>35 767 974</td>
<td>102.44</td>
<td>72 732 400</td>
</tr>
<tr>
<td>Purchased feed</td>
<td>40 739</td>
<td>16 580 773</td>
<td>29.62</td>
<td>21 030 200</td>
</tr>
<tr>
<td>Veterinary</td>
<td>7 613</td>
<td>3 098 491</td>
<td>3.41</td>
<td>2 421 100</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>51 447</td>
<td>20 938 929</td>
<td>31.17</td>
<td>22 130 700</td>
</tr>
<tr>
<td>Variable costs</td>
<td>187 681</td>
<td>76 386 167</td>
<td>166.64</td>
<td>118 314 400</td>
</tr>
<tr>
<td>Fixed cost</td>
<td>97 747</td>
<td>39 783 029</td>
<td>35.84</td>
<td>25 446 400</td>
</tr>
<tr>
<td>Cost of production</td>
<td>285 428</td>
<td>116 169 196</td>
<td>202.48</td>
<td>143 760 800</td>
</tr>
<tr>
<td>Value of production</td>
<td>347 824</td>
<td>141 564 368</td>
<td>224.90</td>
<td>159 679 000</td>
</tr>
<tr>
<td>Net income</td>
<td>62 397</td>
<td>25 395 172</td>
<td>22.42</td>
<td>15 918 200</td>
</tr>
<tr>
<td>For 1000 hectares</td>
<td>22 869 850</td>
<td>9 772 850</td>
<td>22 869 850</td>
<td>25 796 284</td>
</tr>
</tbody>
</table>

Source: Magyar Statisztikai Évkönyv, 1999

Remarks:
1. Figures on cost and benefits regarded to enterprises, partnerships and co-operatives (AKIL, 1998). For small peasants we haven’t related figures. But their efficacy in the production is on the lower level.
2. Number of dairy cows in 1998 was 407 000 (Magyar Statisztikai Évkönyv, 1999).
3. Live weight of pig for slaughter was 710 000 MT. (Magyar Statisztikai Évkönyv, 1999).

Milk production is 22 869 850 HUF, pork production is 25 796 284 HUF producing value for 1000 hectares, which is not negligible even for the decreased animal numbers of Hungary. We can consider the multiplicator effect of animal husbandry, which is an important economical factor, too. Then we can really judge the economical importance of animal husbandry. Accepting the multiplicator 2, which is used by Kliebenstein and Ryan (1999), shows that milk production generates 141 billion HUF and pork production 159 billion HUF multiplicatated (added) economical effect.

Unfortunately, the number of domestic animals has decreased in Hungary the last few years (Table 2). This is connected with the uncertainty surrounding privatization and losing the former Soviet Union's market. Agriculture’s "heavy industry", the cattle industry population fell by about half. Cow numbers fell by
about one-third. It means that calves and beef cattle number decreased more powerfully. That is meat potential loss. The pig and sheep number decrease was significant, as well. Poultry stock's reduction is reasonable, but it is contrasted to FAPRI's poultry-farming prognosis (Meyers and Smith 1997, Varga 1997). This drastic decrease result is illustrated by Horn (1997, 1998):

- The European Union's average number of cows in milk raised on 100 hectares agricultural area is 2.9 times more than in Hungary.
- In Hungary, the livestock number after Trianon's convention was always more than 3 million animal units (1 animal unit = 500 kg live weight of different domestic animals).
- In the worldwide crisis (1930's), the animal unit number was 2.6 million in Hungary. Only the last six years brought a huge fall and the animal unit number became 1.6 million.

<table>
<thead>
<tr>
<th>Denomination</th>
<th>1988</th>
<th>1998</th>
<th>Decrease %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>1690</td>
<td>873</td>
<td>48.34</td>
</tr>
<tr>
<td>Cows</td>
<td>580</td>
<td>407</td>
<td>29.83</td>
</tr>
<tr>
<td>Pigs</td>
<td>8327</td>
<td>5479</td>
<td>34.20</td>
</tr>
<tr>
<td>Sows</td>
<td>746</td>
<td>391</td>
<td>47.59</td>
</tr>
<tr>
<td>Sheep</td>
<td>2216</td>
<td>909</td>
<td>58.98</td>
</tr>
<tr>
<td>Hens</td>
<td>35607</td>
<td>30557</td>
<td>14.18</td>
</tr>
</tbody>
</table>

These facts show that livestock breeding is not utilized well.

Milk and slaughtery pork production for 1998 are shown in table 3 by areas of Hungary. Animal density varies by area. The lowest cow number per hectare is in Central Hungary, with 5.7 cows per 100 hectare. This is also where the fewest number of cows is found. The greatest density is in Western Transdanubia, with 9.2 cows per 100 hectare. The greatest number of cows in total is found in the Northern Great Plains region. The fewest slaughtery pork is bred in Central Hungary, the most in the Southern Great Plain. The possibilities of increasing are prosperous to forage and grain production. Otherwise, the effectiveness in animal husbandry is evident. Market competition will emphasize the increasing of the effectiveness and specialisation. Stock-breeding will be different in some areas.

**Economic conditions for livestock production in Hungary**

The beginning steps for determination of economic conditions and potential expansion of livestock production can be determined by surveying their costs and their costs would include:
- cost and resource advantages
- feed costs, and
- transportation costs.

**Table 3.** Number of cows and pigs by regions (1998)

<table>
<thead>
<tr>
<th>Regions</th>
<th>Agric. area in 1000 ha</th>
<th>Number of dairy cows</th>
<th>% of Hungary</th>
<th>Number of d. cow/100 ha</th>
<th>Number of pigs</th>
<th>% of Hungary</th>
<th>Number of pigs/100 ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Hungary</td>
<td>418,3</td>
<td>24 000</td>
<td>5,9</td>
<td>5,7</td>
<td>254 000</td>
<td>4,6</td>
<td>60,7</td>
</tr>
<tr>
<td>Central Transdanubia</td>
<td>694,1</td>
<td>53 000</td>
<td>13,0</td>
<td>7,6</td>
<td>674 000</td>
<td>12,3</td>
<td>97,1</td>
</tr>
<tr>
<td>Western Transdanubia</td>
<td>682,5</td>
<td>63 000</td>
<td>15,5</td>
<td>9,2</td>
<td>481 000</td>
<td>8,8</td>
<td>70,5</td>
</tr>
<tr>
<td>Southern Transdanubia</td>
<td>866,1</td>
<td>55 000</td>
<td>13,5</td>
<td>6,3</td>
<td>976 000</td>
<td>17,8</td>
<td>112,7</td>
</tr>
<tr>
<td>Northern Hungary</td>
<td>788,5</td>
<td>39 000</td>
<td>9,6</td>
<td>4,9</td>
<td>366 000</td>
<td>6,7</td>
<td>46,4</td>
</tr>
<tr>
<td>Northern Great Plain</td>
<td>1 336,4</td>
<td>94 000</td>
<td>23,1</td>
<td>7,0</td>
<td>1 202 000</td>
<td>21,9</td>
<td>89,9</td>
</tr>
<tr>
<td>Southern Great Plain</td>
<td>1 400,4</td>
<td>79 000</td>
<td>19,4</td>
<td>5,6</td>
<td>1 525 000</td>
<td>27,9</td>
<td>108,9</td>
</tr>
<tr>
<td>Hungary</td>
<td>6 186,3</td>
<td>407 000</td>
<td>100,0</td>
<td>6,6</td>
<td>5 478 000</td>
<td>100,0</td>
<td>88,5</td>
</tr>
</tbody>
</table>

Source: AKII, 1998

Livestock producers have exhibited a wide variation in production costs and returns. Differences between the regions are shown in table 4. The differences of certain areas compared to Hungarian average milk production costs, are much lower, than net income per cow. The regions producing below the average costs earn less average income. On the other hand, it can not be said that there is no need to hunt for possibilities of increasing the competitiveness by cutbacks. Table 5 gives an indication of this alternative.

**Table 4.** Production costs and returns by regions according to the average of Hungary (1997)

<table>
<thead>
<tr>
<th>Regions</th>
<th>Milk production</th>
<th>Pig production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost/ head</td>
<td>Net income/ head</td>
</tr>
<tr>
<td>Hungary</td>
<td>235 242 100</td>
<td>31 942 100</td>
</tr>
<tr>
<td>Central Hungary</td>
<td>242 368 103</td>
<td>46 879 147</td>
</tr>
<tr>
<td>Central Transdanubia</td>
<td>244 736 104</td>
<td>33 472 167</td>
</tr>
<tr>
<td>Western Transdanubia</td>
<td>235 771 100</td>
<td>49 025 153</td>
</tr>
<tr>
<td>Southern Transdanubia</td>
<td>215 384 91</td>
<td>24 294 76</td>
</tr>
<tr>
<td>Northern Hungary</td>
<td>228 351 97</td>
<td>610 2</td>
</tr>
<tr>
<td>Northern Great Plain</td>
<td>238 988 104</td>
<td>14 868 46</td>
</tr>
<tr>
<td>Southern Great Plain</td>
<td>237 207 101</td>
<td>22 155 69</td>
</tr>
</tbody>
</table>

Source: AKII, 1998
Livestock economic potential in Hungary

The low percentage of forage cost is not a result of high performance of fodder method, but others such as a high level of maintenance, repairs, miscellaneous and common cost, which indicate a low level of production control and lack of required discipline.

The aforementioned also concerns pork production considerably.

Feed costs account for the largest portion of total costs for most livestock and types of livestock production operations. Corn cost is typically the dominant item. Thus, access to low cost feed can provide production cost advantages. Regions which have efficient and competitive crop production will have an ingredient for competitive livestock production. This is especially true for those livestock enterprises which utilise large amounts of fodder, a bulky product for transportation.

Tab. 5. - Structure of the direct cost for milk and pig production in Hungary (1998) - %

<table>
<thead>
<tr>
<th>Cost item</th>
<th>Milk production</th>
<th>Pig production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homegrown feed</td>
<td>33,61</td>
<td>59,22</td>
</tr>
<tr>
<td>Purchased feed</td>
<td>10,59</td>
<td>12,22</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>8,74</td>
<td>3,05</td>
</tr>
<tr>
<td>Material cost</td>
<td>52,94</td>
<td>74,49</td>
</tr>
<tr>
<td>Labor</td>
<td>11,11</td>
<td>5,53</td>
</tr>
<tr>
<td>Depreciation</td>
<td>2,08</td>
<td>1,63</td>
</tr>
<tr>
<td>Mainten. &amp; Repair</td>
<td>1,10</td>
<td>0,65</td>
</tr>
<tr>
<td>Auxiliary costs</td>
<td>13,36</td>
<td>4,27</td>
</tr>
<tr>
<td>Direct costs</td>
<td>80,59</td>
<td>86,57</td>
</tr>
<tr>
<td>Common cost</td>
<td>19,41</td>
<td>13,43</td>
</tr>
<tr>
<td>Production cost</td>
<td>100,00</td>
<td>100,00</td>
</tr>
</tbody>
</table>

It is appropriate to survey the percentage of pasture and corn to total area or arable land by regions and compare with the number of cows and pigs (Table 6).

Tab. 6. - Main feed sources and number of cattle and pigs in Hungary (1998)

<table>
<thead>
<tr>
<th>Region</th>
<th>Grassland 1000 ha</th>
<th>% of total land area</th>
<th>Num. of cattle/100 ha</th>
<th>Maize 000 ha</th>
<th>% of arable land</th>
<th>Num. of pigs/100 ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Hungary</td>
<td>63,2</td>
<td>8,58</td>
<td>11,9</td>
<td>51,5</td>
<td>16,63</td>
<td>60,7</td>
</tr>
<tr>
<td>Central Transdanubia</td>
<td>119,9</td>
<td>11,37</td>
<td>17,3</td>
<td>120,1</td>
<td>22,49</td>
<td>97,1</td>
</tr>
<tr>
<td>Western Transdanubia</td>
<td>116,1</td>
<td>9,94</td>
<td>20,5</td>
<td>103,0</td>
<td>19,86</td>
<td>70,5</td>
</tr>
<tr>
<td>Southern Transdanubia</td>
<td>122,0</td>
<td>9,01</td>
<td>13,7</td>
<td>262,0</td>
<td>36,95</td>
<td>112,5</td>
</tr>
<tr>
<td>Northern Hungary</td>
<td>212,0</td>
<td>15,93</td>
<td>9,5</td>
<td>43,4</td>
<td>8,33</td>
<td>46,4</td>
</tr>
<tr>
<td>Northern Great Plain</td>
<td>263,8</td>
<td>14,53</td>
<td>15,1</td>
<td>185,7</td>
<td>18,08</td>
<td>89,9</td>
</tr>
<tr>
<td>Southern Great Plain</td>
<td>250,2</td>
<td>13,57</td>
<td>12,0</td>
<td>256,5</td>
<td>23,56</td>
<td>108,9</td>
</tr>
<tr>
<td>Hungary</td>
<td>1147,2</td>
<td>12,33</td>
<td>14,1</td>
<td>1022,5</td>
<td>21,72</td>
<td>88,6</td>
</tr>
</tbody>
</table>
It is easy to see that a high ratio of pasture is not significant with bigger concentrations of dairying. It is associated with number of cows which would include beef cows, while corn and pig production also shows considerable association. As an important fodder-plant, yields and production cost of corn also gives certain differences in region (Table 7). The yield differences of regions are definitely not so big, except the Northern Great Plain. It is noticeable that there are some areas where the higher average yield involves lower cost production unit, but in some regions the higher yields are combined with higher costs as well.

<table>
<thead>
<tr>
<th>Regions</th>
<th>Average yield (t/ha)</th>
<th>%</th>
<th>Prod. Cost /ha</th>
<th>%</th>
<th>/ t.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary</td>
<td>6.84</td>
<td>100</td>
<td>96 649</td>
<td>14138</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Central Hungary</td>
<td>6.40</td>
<td>93</td>
<td>100 138</td>
<td>15647</td>
<td>111</td>
<td></td>
</tr>
<tr>
<td>Central Transdanubia</td>
<td>6.45</td>
<td>94</td>
<td>98 654</td>
<td>15307</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>Western Transdanubia</td>
<td>7.80</td>
<td>114</td>
<td>114 065</td>
<td>14622</td>
<td>103</td>
<td></td>
</tr>
<tr>
<td>Southern Transdanubia</td>
<td>7.49</td>
<td>109</td>
<td>102 088</td>
<td>13628</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>Northern Hungary</td>
<td>7.11</td>
<td>104</td>
<td>88 487</td>
<td>12452</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>Northern Great Plain</td>
<td>4.93</td>
<td>72</td>
<td>73 663</td>
<td>14948</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>Southern Great Plain</td>
<td>7.24</td>
<td>106</td>
<td>95 819</td>
<td>13227</td>
<td>93</td>
<td></td>
</tr>
</tbody>
</table>

Certainly, regions have to consider the possibilities of corn production development, which could provide advantages for animal husbandry and "value-added" activity. This is all the more considerable, because the 1997 production cost of corn in agricultural companies was extremely high in Hungary. According to U do v e c z (1998), the average production cost was 14138 HUF per ton. The best ten percent of producers cultivated the corn at 10511 HUF, while the worst 10 percent was at 22731 HUF. This large percent difference may lead to the conclusion that there are significant reserves for decreasing production cost like possibilities of changes in production profile. The high cost producers have may be as a consequence of unfavourable production conditions indicating it is more suitable to production of other crops.

The further intensification of pasture production offers some potential. This is established even if we consider the common knowledge that milk production is somewhat detached from pastures and is based on field forage production. In certain areas rotational grazing dairying can be introduced again, or the field harvested by suckler cows breeding or steer producing. These possibilities are important not only for harvesting of pasture yields, but on account of maintenance for given fields, too. This can enhance the concept of sustainable systems.

Transportation costs also impact the competitive position of the livestock production industry. Transportation costs influence production costs considerably in Hungary, because the tax burden of fuel is very high. Unfortunately, the
specific transportation costs can not be determined from the available data, because nearly all cost items include them. To some degree, problem would be imaginable by indirect data and estimation. According to the estimations, wheat is to be produced with 15-25 dollars under the world market price in the interest of competitiveness of Hungary. Geographical position of the country increases transportation costs with this sum. As animal husbandry is export-oriented completely, the geographical disadvantages and problem of transportation costs also apply to it. In addition, one has to reckon that, in some cases, animal husbandry requires the transportation of bulky products.

The livestock production industry has a large number of producers operating in a competitive environment. Controlling production costs and being a low-cost producer is important for long-run industry survival and leadership. For the livestock industry in an area to remain competitive it must develop the infrastructure necessary to remain a low cost producer. This infrastructure would include firms efficiently providing inputs or supply items; firms efficiently producing high quality products; the necessary roads, etc., and marketing services for efficient product transportation, and efficient product processing to transform products into those products which meet consumer preferences.

**Determination of the positions for livestock production development**

The challenge of rural communities and livestock producers is to meet the aim of determining where livestock production fits into area development plans or if it will be met passively and a continuing decline in livestock as an economic base for the community.

Development of livestock production will require much interfacing and integration of the necessary components to be competitive. This will require producers who are highly efficient and operations which are intensively managed. The livestock production infrastructure will need to develop the resource base necessary to meet the challenges of both national and international competition. Effective collaborative efforts between rural communities and livestock producers will be vital for development.

Many elements are necessary for development and/or improvement of a livestock production. With an industry such as the livestock production where there is a large number of producers producing a product of uniform quality, cost leadership is important. Some communities will be able to develop a competitive niche market for a specialised product. However, for most, this will not be feasible and cost leadership will dictate development.

Cost leadership will require good records. Records are needed to remain competitive and be a cost leader. Producers need to know production levels and establish goals to achieve levels similar to what top producers are now achieving.
This includes many factors of production including reproduction, feed usage, labour and facility utilisation. Technological advancements, will further increase the need for good records. Producers positioned to remain competitive have an effective information base for decision making. An increasing amount of information will be infused into the decision process from off-farm sources. In effect the producer becomes a specialist in managing some of the enterprises and relies upon someone else for the intensive management information for the other enterprises.

High-level data collection, regional comparison of costs and results have to underline the industry in Hungary. Hungarian producers have no experience in integration and co-operation. A level of trust will need to be developed. The age­long suspicion of tax offices, their environment, organisation is kept in mind. Forging this trust will be difficult, but a necessary part for success.

Competitiveness in pricing and marketing can also aid in developing a stronger cost leadership position. Participants in the livestock industry need to avail themselves of these opportunities, enhancing their competitive position and the rural areas as well. Input purchase discounts can come from volume buying. An approach such as group buying may provide some of these advantages. Volume selling can provide similar benefits.

The financial sphere too has an important role in developing and enhancing the livestock production. This is through providing the necessary capital as well as encouraging development of financial ratios for use in farm business analysis. Capital is needed for the continual investment in new facilities and remodelling necessary to maintain the cost leadership position. Community efforts may be needed to assure capital access at competitive rates.

Many rural areas have the necessary ingredients for developing a livestock industry which is competitive. In Hungary all regions produce surplus grain. There is also pasture available. Near access to feed grains, availability of labour and management is available. Now, a very important matter is developing the needed institutions and organisations to foster a competitive industry. Factors in the rural areas which serve as expanders as well as inhibitors to an economically competitive and environmentally sound livestock industry need to be identified.

Livestock production offers the potential for growth in many rural areas. For communities looking to livestock production for development, the objective to position the livestock industry for infusion of those technologies which improve the competitive position while maintaining or improving the environmental soundness. Much collaboration is needed between the agricultural livestock producers and the government and local communities to establish as well as internationally cost effective livestock production. This would develop a value added production alternative which would convert lower value raw materials such as pasture, feed grains, etc., into higher value products. In doing so, economic activity would be expanded in the area.
Livestock production in Hungary decreased in the process of the transition between 14.18% for hens and 58.98% for sheep.

Milk and pork production value / 1000 hectares in Hungary for 1998 are respectively 22 869 850 and 25 796 284 HUF.

Accepting the multiplicator 2, shows that milk production generates 141 billion HUF and pork production 159 billion HUF multiplied (added) economical effect.

Animal density is very low and varies by area.

The lowest cow number per hectare is in Central Hungary, the greatest density is in Western Transdanubia.

The fewest slaughtery pork is bred in Central Hungary, the most in the Southern Great Plain.

The high ratio of pasture is not significant with bigger concentrations of dairying.

Regions have to consider the possibilities of corn production development, which could provide advantages for animal husbandry and "value-added" activity.

Controlling production costs and being a low-cost producer is important for long-run industry survival and leadership.

REFERENCES


Received September 4, 2001
Accepted November 7, 2001
STOČARSKA PROIZVODNJA KAO EKONOMSKI POTENCIJAL PO REGIONIMA U MAĐARSKOJ

S. Somogyi and J.B. Kliebenstein

Rezime

U procesu tranzicije stočarska proizvodnja je pretrpela značajne gubitke. Gubitak na brojnom stanju stoke se kreće izmedju 14,18 % za živinu i 58,98 % za ovce.

Vrednost proizvodnje mleka i svinjskog mesa na 1000 hektara u 1998. godini respektivno iznosi 22 869 850 i 25 796 284 HUF.

Ako prihvatimo multiplikacioni koeficijent 2, onda možemo računati da će proizvodnja mleka generirati 141 milijardi HUF dodatne ekonomske aktivnosti a proizvodnja svinjskog mesa 159 milijardi HUF.

Gustina stoke po jedinici površine u Madjarskoj je jako niska i varira po regionima.

Najniži je broj goveda po hektaru u centralnom madjarskom regionu a najveći u zapadnom dunavskom regionu.

Najmanje svinja se proizvodi u centralnom madjarskom regionu a najviše u južnom nizijskom regionu.

Veći procenat travnih površina nije ni u kakvoj značajnijoj vezi sa većom koncentracijom mlečne proizvodnje.

Regioni se moraju baviti mogućnostima razvoja proizvodnje kukuruza, što bi moglo obezbediti određene prednosti za stočarsku proizvodnju kao proizvodjača dodatne vrednosti.

Kontrola troškova i proizvodnja sa niskim proizvodnim troškovima je od posebne važnosti za ekonomsku stabilnost proizvodjača i vodeću poziciju na tržištu.


* Dr Sandor Somogyi, Professor VU-Georgicon Faculty for Agricultural Sciences, Keszthely, Hungary
Dr James B. Kliebenstein, Professor, Dept of Economics, Iowa State University, Ames, Iowa, USA