

# AGRICULTURAL AND FOOD PRODUCTION IN HUNGARY: ON THE ROAD TO SUSTAINABILITY

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In the last 25 years Hungarian agriculture has lost its position. Rapid growth in the world's population requires an increase in food production since one seventh of the population is still starving. The development of agricultural production and the food industry is the basis for the development of rural areas. Hungary produces two per cent of the EU agricultural output, which is far behind its potential. Agriculture, food industry and food trade can only develop together. We need to find the most favourable forms of coexistence with multinational chains sustainably. Food industry is a critical point in the product line, it lags behind the performance of European countries, and resources are insufficient. Long-term co-operation between farmers and processors is inadequate; the common organizations of the markets are minimal. Today, sustainability is increasingly emphasized, environmental and nature protection has been appreciated. The agriculture and forestry sectors are not only suitable for production of food and other raw materials, but they can also replenish resources and have a beneficial effect on biodiversity as well. Today's problems can only be solved by taking sustainability into consideration. Agri-food industry that complies with the requirements can play a major role in rural employment and value creation.

**Keywords:** agribusiness, food industry, employment, sustainability, organic farming

## Introduction

In our study we present the situation of agro-food industry, refer to EU data and explain the requirement of sustainability.

Despite the rapid growth in global agricultural production, the number of starving people in the world now exceeds one billion (Csáki and Jámbor, 2013; Csáki, 2012).

Over the last twenty years, food prices have risen by nearly fifty percent. The effects of climate change increase the risk of agricultural production, making food supply difficult in certain regions.

Today the food chain is an integrated network, its components include industries that provide for farmers and extract raw materials, and all the sectors that process and distribute the products (Szűcs et al., 2017).

Kemény et al. (2012) refer to the role of agribusiness. According to their research, the aggregate weight of agriculture and related industries is 15.5–15.8% of output, 11.2–11.6% of the GDP, and 14.0–14.4% in employment."

We must strive for sustainable agricultural production, where we can count on the regeneration of natural resources and the assimilation capacity of the environment. Precision farming can be integrated into the sustainable management system (Csete and Láng, 2005).

## Material and methods

Agri-food production is decisive in the country's economy. The state of agricultural production in Hungary is presented on the basis of KSH (Hungarian Central Statistical Office) and Eurostat data. The statistical data is organized into tables that are suitably designed and illustrated in figures. Agricultural and food production is analysed in detail and point out the necessity, potential and importance of sustainability. A wide-ranging literature review is provided on the subject under consideration. Based mainly on secondary results, conclusions are drawn and we propose a comprehensive improvement of the situation.

Our conclusions and suggestions are aimed not only at revealing the problems, but also at determining the directions of change. Data for analysis was generally available until 2016.

## Results and discussion

Agriculture is a strategic sector. Its performance varies (depends on the weather) but has improved in recent years. Despite the improvements, our potentials are largely unutilised, mainly due to technological weaknesses and low rates of irrigation. In terms of specific output per hectare we have been doing poorly in the EU, and improving this is essential. A good part of the farmers are aging, and professional knowledge is mostly incomplete for small farmers. Domestic agriculture supplies food products, but the proportion of processed products in our exports is low. Sustainability has been improving, but organic production and precision farming have been spreading rather slowly.

## International outlook

In 2016 the agricultural output of the European Union amounted to €401 billion. Hungary produced 2.1% of agricultural output of the European Union, increasing its production by 0.2% compared to the previous year (KSH, 2017). Table 1 shows data on the EU-27, main countries and Hungary.

The gross added value of agriculture has been increasing in the EU-27, but growth is significant in Hungary (Table 2).

The specific output of countries producing high value horticultural products, milk and meat is more favourable. In the Netherlands, the specific output is €13.2 thousand per hectare, while in Hungary it is €1.3 thousand per hectare. In this respect, Hungary lags behind significantly (Dupcsák et al., 2015).

In order to make data comparable, the Eurostat uses the real income indicator (indicator "A") from an agricultural activity per full time worker (Table 3). Hungary's position in this respect is favourable.

For sustainability it is important to be aware of the size of organic farms.

**Table 1** Agricultural output – at basic prices\* – in the main countries of the EU and in Hungary (million euro)

	2005	2010	2015	2016
EU-27	331 540	364 830	411 761	398 538
France	64 026	68 125	75 168	70 187
Germany	38 838	46 019	51 239	51 225
Italy	46 929	48 160	55 204	52 902
Spain	39 599	40 371	45 491	46 807
Netherlands	21 037	25 319	26 708	26 864
Poland	15 052	19 751	22 349	22 429
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Slovakia	1 693	1 887	2 161	2 182
Hungary	6 116	6 122	8 025	8 411

Source: Eurostat, 2017

\*Output is given at basic prices. The basic price is the price producers receive after deduction of the product tax, including the amount of product subsidies. The output of agriculture includes the aggregate output of goods and services necessary to create agricultural products, services and the secondary activities inseparable from agriculture

**Table 2** The gross added value of agriculture – at basic price\* – in the main countries of the EU and in Hungary (million euro)

	2005	2010	2015	2016
EU-27	152 012	150 237	164 663	158 558
France	28 813	27 862	29 474	25 554
Germany	12 812	14 261	12 957	13 550
Italy	28 449	26 448	32 239	30 065
Spain	24 537	22 366	23 995	25 497
Netherlands	8 714	9 673	9 879	10 260
Poland	6 092	8 236	7 857	8 286
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Slovakia	450	361	474	543
Hungary	2 215	1 980	3 254	3 651

Source: Eurostat, 2017

\*Equals to the difference between the output (at base price) and the current production utilization when calculated on the basis of gross value added. The basic price is the producer's price after deducting product taxes, including the amount of product subsidies. The agricultural sector corresponds to sector 01 of NACE Rev. 1

**Table 3** A-type indicator for agricultural income in certain EU countries\* (2010 = 100)

	2005	2010	2015	2016
EU-27	81.8	100.0	109.7	109.2
France	79.6	100.0	104.6	88.4
Germany	84.7	100.0	78.5	83.0
Italy	115.9	100.0	132.8	121.7
Spain	102.8	100.0	119.9	125.2
Netherlands	87.1	100.0	100.3	108.3
Poland	57.1	100.0	99.4	100.0
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Slovakia	59.3	100.0	142.9	157.0
Hungary	82.9	100.0	153.0	173.0

Source: Eurostat, 2017

\*Indicator "A" corresponds to the net agricultural added value (deflated i.e. calculated in real terms) per working unit per year. Value added is calculated at factor cost. As a deflator the implicit price index of GDP is used for the calculation

The indicator reflects the ratio of organic farming in proportion to the total agricultural area (including organic farms and farms that have not yet totally adopted organic farming during the period). Organic farming is a production method which places great emphasis on the protection of the environment and also on animal welfare in the case of animal husbandry. It avoids the use of synthetic chemicals – fertilizers, insecticides, additives, medicines – or greatly reduces the amounts used.

At the EU level, organic farming is considered a farming mode only if it complies with the Council Regulation 2092/91 and its amendment, which sets out a comprehensive framework for organic crop and livestock production, labelling, processing and marketing, and at the same time it also regulates the imports of organic products to the EU (Internet 1). The data is presented in Table 4.

**Table 4** Organic farming in certain countries (%)

	2005	2010	2015
EU-27	3.60	5.20	---
France	1.90	2.90	4.54
Germany	4.70	5.90	6.34
Italy	7.30	8.60	11.79
Spain	3.10	6.70	8.24
Netherlands	2.50	2.50	2.67
Poland	1.00	3.30	4.03
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Slovakia	4.60	9.10	9.47
Hungary	2.20	2.40	2.43

Source: Eurostat, 2017

Hungary has hardly increased organic farming in the past decade, while others have made significant advances. Weak internal consumption probably also plays a role; few people can afford healthier products.

**Table 5** The food industry in the national economy

Year	The ratio of agriculture <sup>1</sup> in				The ratio of food-, beverage-, tobacco <sup>3</sup> production in				Price index previous year = 100	
	GDP	gross value added	investment	employment <sup>2</sup>	GDP	gross value added	investment	employment <sup>2</sup>	food <sup>4</sup>	total
1995	7.1	8.4	2.9	8.0	3.4	4.0	6.8	–	131.1	128.2
2000	4.9	5.7	4.7	6.6	2.8	3.3	2.8	–	109.2	109.8
2005	3.7	4.3	4.5	5.0	2.3	2.7	2.7	3.6	102.5	103.6
2006	3.5	4.0	4.2	4.9	2.2	2.5	2.5	3.6	107.7	103.9
2007	3.4	4.0	3.7	4.7	2.0	2.4	2.5	3.4	111.5	108.0
2008	3.4	3.9	4.7	4.4	1.9	2.2	1.8	3.3	110.2	106.1
2009	3.0	3.5	5.6	4.7	2.2	2.6	1.9	3.5	104.4	104.2
2010	3.0	3.5	4.8	4.6	2.0	2.4	2.2	3.3	103.2	104.9
2011	3.9	4.6	5.6	4.9	1.9	2.2	2.5	3.2	106.6	103.9
2012	3.9	4.6	5.8	5.0	1.9	2.5	2.5	3.2	105.9	105.7
2013	3.9	4.6	5.9	4.7	2.0	2.4	2.6	3.3	102.8	101.7
2014	4.0	4.7	6.0	4.6	2.0	2.3	2.9	3.5	99.6	99.8
2015	3.5	4.1	4.8	4.8	1.9	2.3	2.2	3.3	100.9	99.9
2016	3.8	4.5	5.5	5.0	–	–	3.7	3.3	100.7	100.4

Source: KSH, AKI, 2017

1 – agriculture, forestry and fisheries, 2 – labour force survey data, 3 – businesses in the food, beverage and tobacco products sector, 4 – by product and service groups

## The situation of the agri-food industry in Hungary

In 2016, the share of agriculture increased significantly in investment (5.5%) and in employment (5.0%). The role of the food industry is also significant in investment (3.7%) and in employment (3.3%) in the year under review. The details are shown in Table 5.

The emphasis on cereals and industrial crops is still decisive in the sowing structure (Figure 1).

The change of the ratio of crop and livestock production in agriculture is a serious problem. As the result of subsidies, crop production is 58% and livestock and livestock products are 34% in the total agricultural production. The share of livestock production must be increased, but this is made difficult by the fact that the lowest producer price growth was realised in this sector (Figure 2).

The situation of the food industry is worse than that of agriculture. Its profitability is low; its own resources are scarce.

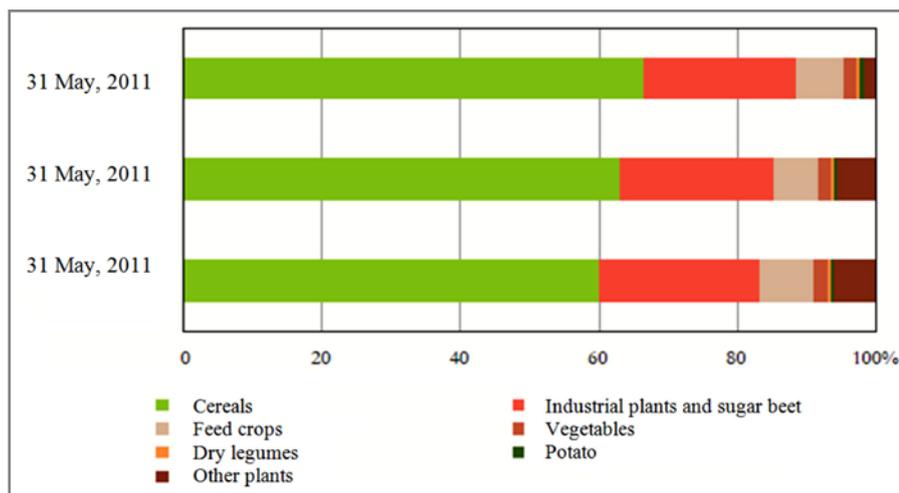
The income distribution of food product lines is different, incomes in production and processing are lower, and the winner is often trade (Szűcs et al., 2017). Nowadays, the food industry is beginning to shift, in almost every sector the production value is growing.

## Employment

The role of the agri-food industry in rural employment is significant. Contrary to international trends, the labour demand for agriculture has increased slightly. However, aging is a serious problem, young people are reluctant to undertake work in the agricultural area, and their qualifications are poor (Kapronczai, 2016). Table 6 shows the utilization of labour in agriculture according to the Hungarian Accounting System (MSZR).

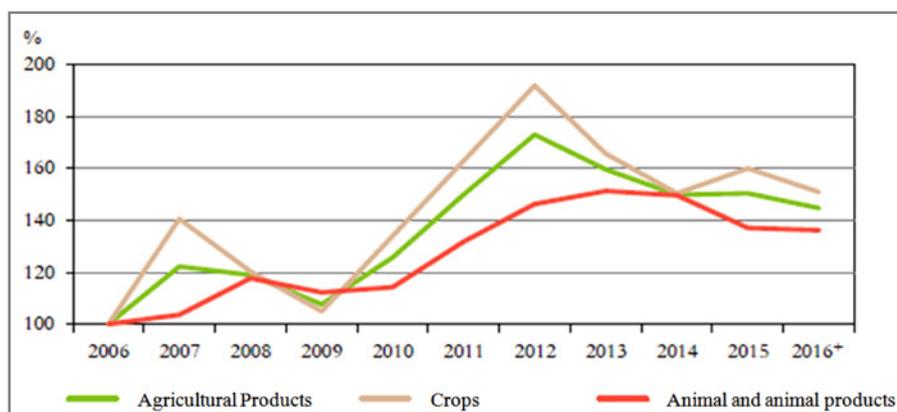
Efforts must be made and changes initiated so that the young and new generations are happy to take on work in agriculture. This can lead to increased efficiency (Farkasné Fekete et al., 2014).

The diverse forms of cooperation and partnership are indispensable, as has already been pointed out by many (Tégla et al., 2016; Hågen et al., 2016; Szabó, 2011).



**Figure 1** Sowing structure

Source: KSH, 2017



**Figure 2** Producer price index of agricultural products (2006 = 100%)

Source: KSH, 2017

climate change, loss of biodiversity, unsatisfactory water resources management, and the health effects of pollution and hazardous chemicals.

Unless the principles of sustainability are met, climate change resulting from air pollution can be a serious threat. Changes can be measured by means of indicators. Sustainable agriculture and rural development are important areas for conserving natural resources.

Nowadays all economic trends address the issues of environmental regulation. The aim of environmental regulation is to comply with certain environmental quality standards, which also apply to agricultural production (Magda, 2010a).

Magda (2010b) explains that the most important issues to be addressed in sustainability include biodiversity, management of Natura 2000 sites, water and soil conservation, mitigation of climate change, including greenhouse gas reductions, ammonia emissions and, of course, the use of plant protection products that meet the requirements of sustainability.

Our world is finite; therefore, it is clear that sustainable economic growth has limitations (Mészáros, 2010). Today there are representatives of non-growth theory whose aim is to "create a society in which we live better while we work less and consume less (Latouche, 2011).

The current growth paradigms are unsustainable. This means that the world and Hungary, for the sake of sustainability, must have a green growth vision. The UN, the EU and the OECD play the pioneering role in the "green growth" methodology. Our goal is to achieve a synergistic relationship between economic growth and environmental protection by using less energy (Pomázi and Szabó, 2013).

Agricultural production has a significant responsibility for preserving the state of the environment and biodiversity, as agriculture is the largest user of land. It uses natural resources and is a major polluter.

Agricultural production also plays economic, environmental and social roles (Boody et al., 2005; Huang et al., 2015). Social aspects of sustainable agriculture are important factors of competitiveness (Csete and Láng, 2009). There are common elements in sustainable agriculture, such as:

- ensuring food supply in good quality,

## Sustainable development and sustainability in agriculture

From the perspective of the future, sustainability analysis is indispensable. We believe that our agri-food production can only be developed according to the principles of sustainability.

"Building a Sustainable Society" (Brown, 1981) was published in 1981, in which the principle of sustainable development first appeared fully. From that time on factors affecting the economy, society and the environment were addressed systematically.

The United Nations Environment and Development Committee propagated and

disseminated the theory of sustainability. The committee developed a sustainable development plan under the leadership of Gro Harlem Brundtland, the Norwegian Prime Minister. The Final Report was published as "Our Common Future" (Brundtland, 1987).

Sustainable development in the interpretation of the Brundtland report is "a development that satisfies the needs of the present, without jeopardizing the ability of future generations to meet their needs".

According to the OECD Environmental Outlook (OECD 2012), the greatest challenges for both the OECD and the non-OECD countries are

**Table 6** Agricultural labour use according to MSZR (Measurement unit: Annual Workforce Unit)

	2010	2011	2012	2013	2014	2015
Total	444 157	436 951	423 279	444 424	462 930	474 283
Paid	109 176	108 062	124 767	120 820	126 766	128 033
Not paid	334 981	328 889	318 512	323 604	336 165	346 250

Source: KSH, 2016

- ❑ the preservation of the quality of the environment,
- ❑ the viability and profitability of agricultural activity,
- ❑ improving the quality of life in rural areas, social justice (Valkó, 2017).

The sustainability of agriculture can be followed by an analysis of indicators. In Hungary, Farkasné et al. (2004) and Valkó et al. (2008) played a significant role in this field. The topic is also addressed by the United Nations.

FAO's (Food and Agriculture Organization of the United Nations) SAFA system (Sustainability Assessment of Food and Agriculture Systems) established in 2013 plans to evaluate food and the effects of agricultural systems on the environment and on humans. The sales criteria are organized around four groups (FAO, 2013):

- ❑ good leadership,
- ❑ environmental integrity,
- ❑ economic adaptability,
- ❑ social prosperity.

Therefore, the role of the agri-food industry is extremely important in sustainability. That is why it is necessary to adhere to these principles in production.

## Conclusions

The development of agricultural and food production in Hungary has recently been commendable, but it is far from its potential. Popp et al. (2008) believe that the challenges of nutrition, environmental security and sustainability require a new adaptation strategy. The decline in agricultural production would generate significant social problems. Growing horticultural production would be advisable as geothermal energy provides cheap heating in crop production and employment can be significant in this sector (Tégla and Marselek, 2007).

Magda, R. and Magda, S. (2012) see the future in increased processing, which requires strong food industry.

The issue of increasing irrigated areas has long been discussed and it is also timely to achieve results in this area.

In our country there is a significant land extracted from production; measures to reduce unused land are necessary.

Today, the principle of sustainability has been emphasized. For the future, we need to walk along this path, while respecting the regulations. Intensive co-operative development would be indispensable to improve the potentials of rural areas.

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