

THE COMPETITIVENESS OF AGRICULTURAL HOLDINGS IN BULGARIA¹

In an effort to fill the existing gap regarding the definition of the competitiveness of agricultural holdings and the ways to measure it, the present research applies a holistic approach in the assessment of the competitiveness of agricultural holdings in Bulgaria as a whole, as well as in terms of their different specialization. Despite its importance and the continuing debates on the topic, there is still no consensus on what the competitiveness of farms is; how to measure the competitiveness of different organizations in agriculture; what the absolute and comparative competitiveness of different types of farms is; which are the critical factors for increasing the competitiveness at the current stage of development, etc. The multi-criteria assessment found that although the level of competitiveness of Bulgarian farms is overall good, more than a third of all farms in the country show a low level of competitiveness. This can largely be attributed to their low adaptive potential and economic efficiency. The most competitive farms are those specializing in the beekeeping sector, followed by field crops, mixed livestock and mixed crop production, while farms specializing in grazing livestock are the least competitive. The proposed approach should be improved and applied more widely and periodically, increasing its accuracy and representativeness. The latter requires close cooperation with producer organizations, the National Agricultural Advisory Service (NAAS) and other stakeholders, as well as improvements to the agricultural information collection system in the country.

JEL: Q1; Q11; Q12; Q13; Q14; Q15; Q17; Q18

Keywords: competitiveness; agricultural holdings; Bulgaria

The problem of determining the competitiveness of various economic organizations has been among the most topical academic and practical (aimed at improving business strategies and policies) issues since the emergence of economics science (Falciola and Rollo, 2020; Dresch et al., 2018; Westeren et al., 2020; Wisenthige and Guoping, 2016). It is particularly important for the agricultural sector, which is characterized by many participants (including foreign ones), high specialization and exchange, strong competition at a local, national and international level, and highly integrated food and supply chains. Moreover, this sector has a number of specificities such as the dominance of small property ownership and informal management; the existence of quasi-monopoly situations in supply and sales; strong dependence on natural conditions; unequal public support; market segmentation; strong state regulation; processing and trade chains, professional organizations, etc.; strong consumer pressure for quality, eco-behavior, etc.; presence

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of underdeveloped and non-competitive “markets”; the need for new approaches, etc.

The problem of competitiveness has become particularly relevant in recent decades as a result of the fundamental development of the Theory of Economic Organizations (Bachev, 2012; Porter, 1980; Williamson, 1996), the processes of globalization and competition, and the new social and market “order” as defined by international agreements and institutions (World Trade Organization, World Bank, International Monetary Fund, European Union, EC; FAO; OECD, etc.). The latest processes such as the COVID-19 pandemic, climate change, the fundamental reform and “greening” of the Common Agricultural Policy (CAP) of the European Union (EU), widespread digitalisation, etc. pose new challenges to the competitiveness of agricultural producers in the country and around the world.

Despite its importance and the long-term lively discussions on the topic, there is still no consensus on: what is the competitiveness of agricultural holdings; how to measure the competitiveness of different organizations in agriculture; what is the absolute and comparative competitiveness of different types of agricultural farms; which are critical factors for increasing the competitiveness at the current stage of development, etc. Addressing all these issues is not just an important research matter, but a question of concern to farm managers and owners, professional and non-governmental organizations, politicians and the general public. It is no coincidence that increasing the viability and competitiveness of the sectors and agricultural producers has again been identified as one of the strategic objectives of the EU CAP for the new programming period 2021-2027 (EU, 2018).

Numerous studies have emerged in recent years on various aspects of the competitiveness of farms of different (mostly small) sizes (Alam et al., 2020; Berti and Mulligan, 2016; Latruffe, 2010, 2013; Lundy et al., 2010; Mmari, 2015; Ngenoh et al., 2019; Orłowska, 2019), in selected countries (Alam et al., 2020; Benson, 2007; Jansik and Irz, 2015; Hadley, 2006; Popovic, Knezevic and Tosin, 2009; Kleinhanss, 2020; Krisciukaitiene, Melnikiene, Galnaityte, 2020; Nivievskyi et al., 2011; Nowak, 2016; Mykhailova et al., 2018; Orłowska, 2019; Ziętara, Adamski, 2018), subsectors (Alam et al., 2020; Benson, 2007; FAO, 2010; Jansik and Irz, 2015; Kleinhanss, 2020; Marques et al., 2011; Marques, 2015; Nivievskyi et al., 2011; Ngenoh et al., 2019; Oktariani, Daryanto, and Fahmi, 2016; Ziętara and Adamski, 2018), farming systems, such as organic, vertically integrated, greenhouse, etc. (Marques, 2015; Orłowska, 2019), regions (Marques et al., 2011; Nowak, 2016) and product chains (Lundy et al., 2010; Ngenoh et al., 2019). A number of comparative studies have been conducted in different EU countries (FAO, 2010; Jansik and Irz, 2015; Nowak and Krukowski, 2019; Ziętara and Adamski, 2018) as a means of determining the technological, institutional and organizational factors for improving farm competitiveness (Berti, Mulligan, 2016; Mmari, 2015; Ngenoh et al., 2019; Oktariani, Daryanto, and Fahmi, 2016; OECD, 2011), etc.

To date, however, there is no widely accepted and comprehensive framework for understanding and assessing the competitiveness of farms in different market,

economic, institutional and natural environments. Usually, the competitiveness of agricultural holdings is not well-defined and is assessed through traditional indicators of technical efficiency, productivity, profitability, etc. Rarely is a systematic approach applied to the formulation of pillars and the principles of competitiveness; to the criteria and indicators for evaluating its level; to the integration and interpretation of assessments, etc. Moreover, important aspects of farm competitiveness such as management efficiency, potential and incentives for adaptation, and “long-term” sustainability are often completely ignored in the analyses.

In Bulgaria, modern research on the absolute and comparative competitiveness of agricultural holdings is at the beginning stage (Andonov, 2013; Alexiev, 2012; Borisov, 2007; Bachev, 2010, 2010a, 2011, 2017; Ivanov et al., 2020; Koteva and Bachev, 2010, 2021; Koteva, 2016; Koteva et al., 2018; Slavova et al., 2011;). The number of publications on the level of competitiveness of agricultural holdings at the stage of EU CAP implementation is insignificant. In addition, there are practically no comprehensive studies on the competitiveness of farms with different product specializations at the current stage of development of the sector. This deters both the farms’ management and the improvement of public support policies for the different types of producers. This article tries to fill in the existing gap by applying a holistic approach and assessing the competitiveness of farms in Bulgaria, both as a whole and in terms of their different specializations.

Research methodology

Competitiveness means the internal capability (potential, incentives) of the agricultural holding to maintain sustainable competitive positions on (certain) market(s), which leads to high economic performance through continuous improvement and adaptation to the changing market, natural and institutional environment (Bachev, 2010; Koteva and Bachev, 2010, 2021). The level of competitiveness is always specific to a particular market-oriented farm in relation to the markets in which it sells its products and services.

Efficiency, financial endowment, adaptability and sustainability are the main pillars of the competitiveness of agricultural holdings. *Good* competitiveness means that a farm (1) produces and sells its products and services efficiently on the market; (2) manages its financing efficiently; (3) is adaptable to the evolving market, institutional and natural environment; and (4) is sustainable in time (Bachev, 2010; Koteva and Bachev, 2010). Conversely, insufficient (lack of) competitiveness indicates that the farm has serious problems in terms of efficient financing, the production and sale of its products due to high production and/or transaction costs, its inability to adapt to the evolving conditions of the environment and/or its insufficient sustainability over time.

For assessing the particular and integral level of competitiveness of Bulgarian farms, a holistic approach is applied, which includes a system of 4 criteria and 17 indicators and reference values, taking into account the economic efficiency, financial capabilities, adaptation potential and level of sustainability of farms. The choice of

appropriate reference values is particularly important for an adequate assessment of the level of competitiveness. For example, a significant overpassing of the sectoral productivity and profitability is a sign of (higher) efficiency and competitiveness of farms; while a lack of “sufficient” liquidity shows low financial capability and low (lack of) competitiveness; the serious problems of the marketing of the produce and the lack of an heir willing to take over the farm are a sign of low sustainability and competitiveness, etc. A detailed presentation of the applied holistic approach, and the criteria for the selection and integration of the indicators for assessing the competitiveness of farms in Bulgaria is presented by Bachev (2010) and Koteva and Bachev (2010; 2021).

There is a lack of adequate (statistical and other) information in the country for assessing the various aspects of competitiveness of agricultural farms. In this study, the assessment of the level of competitiveness of farms is based on primary (survey) micro information provided in the summer of 2020 by the managers of 319 “typical” farms² of different types, production specializations and geographical locations. The structure of the surveyed farms approximately corresponds to the real structure of the farms in the country and in the main sub-sectors of the agricultural production sector in Bulgaria.

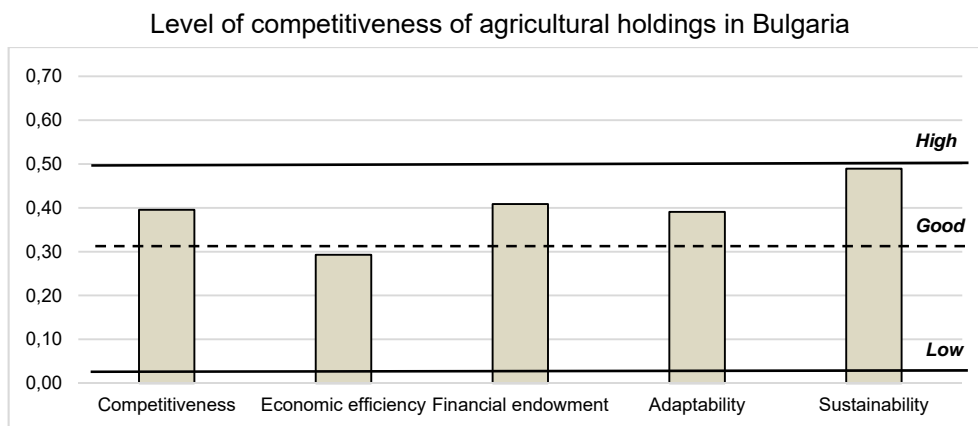
The farm managers were given the opportunity to indicate one of the three levels (low, good, high) which most closely corresponds to the condition of their holding for each indicator of the four competitiveness criteria. The qualitative assessments of the managers were transformed into quantitative values, as the high levels were assessed with 1, the intermediate with 0.5, and the low with 0. For each of the agricultural holdings, an integral competitiveness index was calculated for the individual criteria and as a whole as an arithmetic average. The competitiveness indices of farms with different types of specializations were obtained as an arithmetic average of the individual indices of the constituent holdings. To determine the overall level of competitiveness, the following benchmarks, set up by leading experts in the field, were used: high level 0.51-1, good level 0.34-0.5 and low level 0-0.32.

The level of competitiveness of Bulgarian farms

The multi-criteria assessment of the competitiveness of agricultural holdings in the country shows that it is at a *good level* with a competitiveness index of 0.4 (Figure 1). The relatively high *sustainability* of farms (index 0.49) and, to a lesser extent, their good *financial endowment* (index 0.41) contribute the most to maintaining this level of competitiveness. On the other hand, the *adaptability* of agricultural holdings is relatively lower (index 0.39), and their *economic efficiency* is low (index 0.29). Therefore, the low potential for adaptation and the unsatisfactory economic efficiency contribute to the greatest extent to the decrease in the competitiveness of the Bulgarian farms, as they are critical for maintaining its level and restrict its increase.

² The authors thank the National Agricultural Advisory Service for their assistance and thank all the managers of the surveyed farms for the information provided.

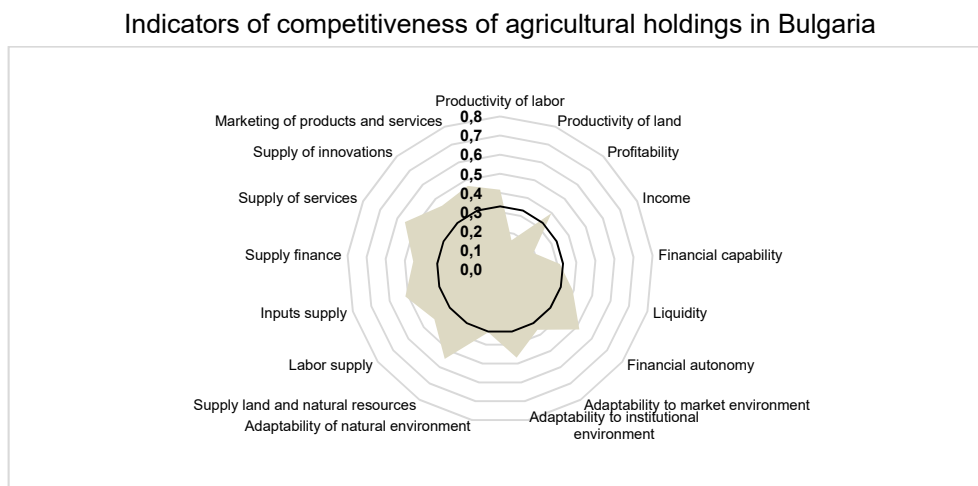
Figure 1



Source. Author's calculations.

The analysis of the individual indicators of competitiveness shows the factors that most contribute to or limit the competitiveness of agricultural holdings in the country. At the present stage, the increase in the competitiveness of farms is limited by their extremely low *productivity* (0.16), *profitability* (0.19), *financial capability* (0.31) and *adaptability* to changes in the natural environment (rising temperatures, extreme weather, droughts, storms, etc.) – 0.33 (Figure 2). Therefore, both public support for farms and their management development strategies should be focused on these areas, as they are crucial for their competitiveness.

Figure 2



Source. Author's calculations.

On the other hand, a number of indicators of the competitiveness of farms are at a high level and show the comparative and absolute competitive advantages of Bulgarian farms. At the present stage, the *lack of serious problems and difficulties in the efficient supply of necessary services* (0.56), the *efficient supply of land and natural resources* (0.55), the *efficient supply of materials, equipment and biological resources* (0.51), and the *low dependence on external financing* (credit, state aid, etc.) or *high financial autonomy* (0.52) contribute to increasing the competitiveness of agricultural holdings to the greatest extent.

Figure 3

Share of agricultural holdings with different levels of competitiveness in Bulgaria (in %)

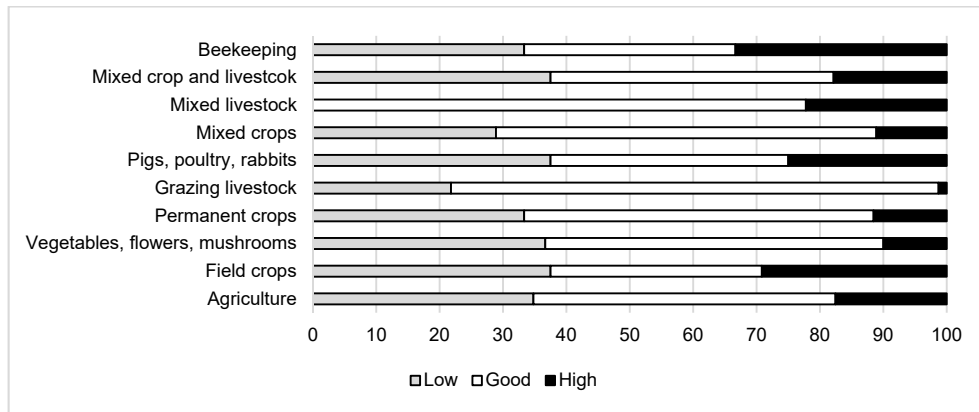
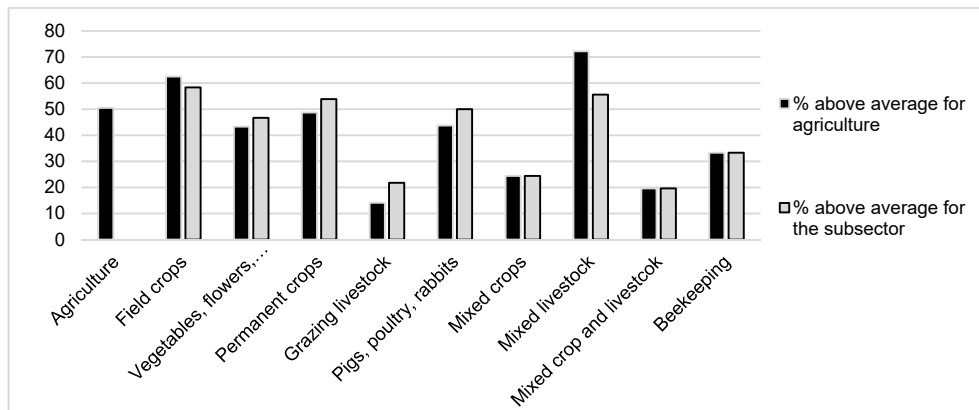


Figure 4

Share of agricultural holdings with a level of competitiveness above the average for agriculture and the sub-sector in Bulgaria



Source. Author's calculations.

The assessment of the competitiveness of agricultural holdings shows that the majority of them (47.65%) have a good level of competitiveness (see Figure 3). Slightly more than half of the Bulgarian farms (50.47%) have a level of competitiveness above the national average (see Figure 4), and only 17.55% of all farms in the country have a high level of competitiveness. At the same time, however, more than a third of all farms (34.8%) have a low level of competitiveness. This means that a large part of Bulgarian farms will cease to exist in the near future due to insufficient competitiveness if timely measures are not taken to increase their competitiveness by improving their management and restructuring, through adequate state support, etc.

The vast majority of managers surveyed (64%) rated the competitiveness of their farms as good (Figure 5). The self-assessment of a large part of the managers differs from the multicriteria assessment made in this study, as the deviations are in both directions. Every tenth manager underestimates the (higher) level of competitiveness of their farm, and about 5% overestimate it. This means that independent multi-criteria assessments of competitiveness for the real situation would raise awareness and improve the management of a significant part of the farms in the country.

Figure 5

Comparison of the multicriteria assessment with the self-assessment of the managers of the competitiveness of the agricultural holdings in Bulgaria



Source: Author's calculations; Survey of agricultural producers, 2020.

The analysis of the share of farms with different levels of competitiveness indicators gives a clear idea of the situation in the country. The majority of Bulgarian farms have productivity and profitability, well below the national average – 68.54% and 62.79%, respectively (Table 1). Also, a significant part of the farms have low financial capability (38.02%), high dependence on external financing (loans, subsidies, etc.) (23.95%) and a low ability to pay their current liabilities (26.58%) (Table 2). In addition, 31.65% of the farms in the country have low adaptability to changes in the market environment (demand, prices, competition, etc.), 18.99% have insufficient adaptability to the institutional environment and constraints (national and European requirements for quality, safety, environment, etc.), and 36.39% have a low ability to adapt to changes in the natural environment (rising temperatures, extreme weather, drought, storms, etc.) (Table 3).

Table 1

Share of agricultural holdings with different levels of the indicators of economic efficiency in Bulgaria (in %)

Indicators levels	Agriculture	Field crops	Vegetables, flowers and mushrooms	Permanent crops	Grazing livestock	Pigs, poultry and rabbits	Mixed crops	Mixed livestock	Mixed crops and livestock	Beekeeping
<i>Productivity</i>										
Low	22.40	12.50	13.79	30.77	28.13	31.25	18.18	11.11	23.21	33.33
Good	71.92	70.83	82.76	61.54	71.88	62.50	81.82	83.33	75.00	44.44
High	5.68	16.67	3.45	7.69	0.00	6.25	0.00	5.56	1.79	22.22
<i>Profitability</i>										
Unsatisfactory	25.55	16.67	17.24	32.05	31.25	25.00	22.73	16.67	28.57	44.44
Good	69.40	70.83	79.31	61.54	68.75	75.00	75.00	77.78	69.64	33.33
High	5.05	12.50	3.45	6.41	0.00	0.00	2.27	5.56	1.79	22.22
<i>Gross Output*</i>										
Similar to the average	10.93	16.67	10.71	9.86	3.13	0.00	20.45	6.67	3.57	28.57
A little more than the average	3.64	12.50	3.57	4.23	3.13	0.00	0.00	0.00	5.36	0.00
A lot more than the average	1.32	0.00	0.00	1.41	0.00	0.00	2.27	0.00	3.57	0.00
A little less than the average	15.56	25.00	7.14	11.27	12.50	6.67	22.73	26.67	17.86	0.00
A lot less than the average	68.54	45.83	78.57	73.24	81.25	93.33	54.55	66.67	69.64	71.43
<i>Net Income**</i>										
Similar to the average	10.63	16.67	10.71	9.72	0.00	0.00	20.93	0.00	5.36	28.57
A little more than the average	4.65	12.50	3.57	6.94	3.23	0.00	0.00	6.67	5.36	0.00
A lot more than the average	1.66	0.00	0.00	2.78	0.00	0.00	2.33	0.00	3.57	0.00
A little less than the average	20.27	29.17	3.57	15.28	16.13	20.00	30.23	33.33	17.86	14.29
A lot less than the average	62.79	41.67	82.14	65.28	80.65	80.00	46.51	60.00	67.86	57.14

* Average Gross Output for the country = BGN 133,200; ** Average Net Income for the country = BGN 38,000.

Source. Survey of agricultural producers, 2020.

Table 2

Share of agricultural holdings with different levels of the indicators for financial endowment in Bulgaria (in %)

Indicators levels	Agriculture	Field crops	Vegetables, flowers and mushrooms	Permanent crops	Grazing livestock	Pigs, poultry and rabbits	Mixed crops	Mixed livestock	Mixed crops and livestock	Beekeeping
<i>Financial capability</i>										
Low	38.02	26.09	46.43	40.26	51.61	50.00	28.89	22.22	39.29	44.44
Good	61.34	73.91	53.57	59.74	48.39	50.00	71.11	77.78	58.93	44.44
High	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79	11.11
<i>Dependence on external financing (credit, state support, etc.)</i>										
Low	27.83	30.43	28.57	28.38	28.13	26.67	25.58	16.67	30.36	33.33
Average	48.22	52.17	46.43	50.00	40.63	46.67	46.51	55.56	44.64	55.56
High	23.95	17.39	25.00	21.62	31.25	26.67	27.91	27.78	25.00	11.11
<i>Possibility to pay current debts</i>										
Low	26.58	25.00	31.03	24.68	43.75	33.33	15.56	22.22	32.14	22.22
Good	68.04	66.67	65.52	71.43	56.25	66.67	73.33	72.22	66.07	55.56
High	5.38	8.33	3.45	3.90	0.00	0.00	11.11	5.56	1.79	22.22

Table 3

Share of agricultural holdings with different levels of the indicators of adaptability (in %)

Indicators levels	Agriculture	Field crops	Vegetables, flowers and mushrooms	Permanent crops	Grazing livestock	Pigs, poultry and rabbits	Mixed crops	Mixed livestock	Mixed crops and livestock	Beekeeping
<i>Adaptability to the market (prices, demand, competition)</i>										
Low	31.65	25.00	17.24	37.66	50.00	25.00	24.44	33.33	33.93	33.33
Good	62.66	62.50	72.41	59.74	46.88	62.50	73.33	61.11	64.29	33.33
High	5.70	8.33	10.34	3.90	3.13	12.50	2.22	5.56	0.00	33.33
<i>Adaptability to the state and European requirements for quality, safety, environment, etc.</i>										
Low	18.99	20.83	20.69	11.69	34.38	18.75	20.00	16.67	23.21	0.00
Good	68.35	66.67	72.41	77.92	65.63	62.50	64.44	50.00	66.07	66.67
High	12.66	12.50	6.90	10.39	0.00	18.75	15.56	33.33	8.93	33.33
<i>Adaptability to changes in the natural environment (rising temperatures, extreme weather, drought, storms, etc.)</i>										
Low	36.39	29.17	34.48	41.56	34.38	37.50	33.33	22.22	46.43	22.22
Good	60.44	66.67	65.52	55.84	59.38	62.50	64.44	61.11	51.79	66.67
High	36.39	29.17	34.48	41.56	34.38	37.50	33.33	22.22	46.43	22.22

Source. Survey of agricultural producers, 2020.

Table 4

Share of agricultural holdings with different levels of indicators of sustainability in Bulgaria (in %)

Indicators levels	Agriculture	Field crops	Vegetables, flowers and mushrooms	Permanent crops	Grazing livestock	Pigs, poultry and rabbits	Mixed crops	Mixed livestock	Mixed crops and livestock	Beekeeping
<i>Nature of the problems in the effective supply of necessary land and natural resources</i>										
Insignificant	18.65	20.83	22.22	14.29	18.75	40.00	20.45	11.11	14.55	50.00
Normal	72.67	75.00	77.78	75.32	62.50	53.33	72.73	72.22	78.18	37.50
Significant	8.68	4.17	0.00	10.39	18.75	6.67	6.82	16.67	7.27	12.50
<i>Nature of the problems in the effective supply of necessary labor force</i>										
Insignificant	16.67	16.67	27.59	10.26	18.75	18.75	8.89	5.56	25.00	44.44
Normal	52.83	66.67	51.72	53.85	40.63	68.75	53.33	50.00	50.00	33.33
Significant	30.50	16.67	20.69	35.90	40.63	12.50	37.78	44.44	25.00	22.22
<i>Nature of the problems in the effective supply of necessary materials, equipment and biological resources</i>										
Insignificant	12.97	12.50	24.14	10.53	9.38	6.25	13.33	11.11	12.50	33.33
Normal	76.90	79.17	65.52	75.00	78.13	81.25	82.22	77.78	76.79	66.67
Significant	10.13	8.33	10.34	14.47	12.50	12.50	4.44	11.11	10.71	0.00
<i>Nature of the problems in the effective supply of necessary funding</i>										
Insignificant	12.03	4.17	10.34	15.58	9.68	0.00	13.33	16.67	14.29	22.22
Normal	67.09	83.33	58.62	70.13	54.84	87.50	57.78	72.22	62.50	77.78
Significant	20.89	12.50	31.03	14.29	35.48	12.50	28.89	11.11	23.21	0.00
<i>Nature of the problems in the effective supply of necessary services</i>										
Insignificant	18.41	8.33	27.59	21.05	15.63	25.00	15.56	16.67	19.64	22.22
Normal	74.29	79.17	72.41	71.05	75.00	62.50	80.00	72.22	73.21	77.78
Significant	7.30	12.50	0.00	7.89	9.38	12.50	4.44	11.11	7.14	0.00
<i>Nature of the problems in the effective supply of necessary innovations and know-how</i>										
Insignificant	17.46	16.67	14.29	21.79	18.75	18.75	17.78	23.53	12.50	11.11
Normal	55.24	58.33	57.14	61.54	37.50	50.00	53.33	52.94	55.36	88.89
Significant	27.30	25.00	28.57	16.67	43.75	31.25	28.89	23.53	32.14	0.00
<i>Nature of the problems in the effective realization of the products and services</i>										
Insignificant	12.46	20.83	17.86	14.29	6.45	12.50	11.11	5.56	10.71	12.50
Normal	68.69	66.67	71.43	63.64	67.74	62.50	75.56	83.33	67.86	62.50
Significant	18.85	12.50	10.71	22.08	25.81	25.00	13.33	11.11	21.43	25.00

Source. Survey of agricultural producers, 2020.

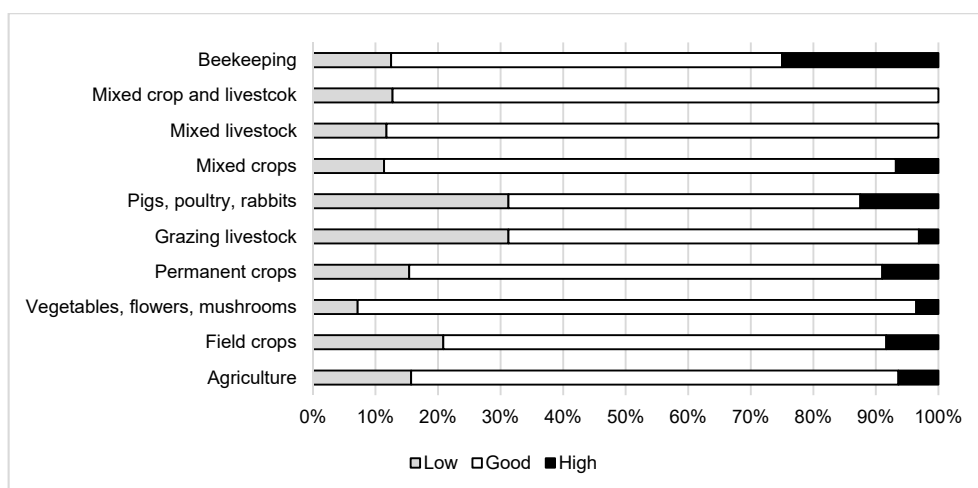
The survey also found that a significant part of the farms in the country have serious problems with the effective provision of the necessary labor force (30.5%), the necessary financing (20.89%), the necessary innovations and know-how (27.30%),

and the effective marketing of production and services (18.85%) (Table 4). In addition, for every tenth farm there are major problems in the efficient supply of the necessary materials, equipment and biological resources (10.13%), for every ninth – in the effective supply of the necessary land and natural resources (8.68%), and for every seventh – in the effective supply of the necessary services (7.30%). All this contributes significantly to reducing the sustainability and competitiveness of a significant part of the holdings in the country.

According to the managers of a large part of the farms in the country (15.71%), their farms have low sustainability in the medium term and are likely to cease to exist due to bankruptcy, cessation of business, acquisition by competitors, etc. (Figure 6).

Figure 6

How do you assess the sustainability of the agricultural holding in the medium term?



Source. Survey of agricultural producers, 2020.

The vast majority of managers (77.88%) evaluate the sustainability of their farms as good (Figure 7). In contrast to competitiveness, in the self-assessments of sustainability, there is almost a coincidence of the share of farms with low sustainability with that of the multi-criteria assessment in the study. However, there is a significant underestimation of the level of “real” sustainability in the self-assessment of the managers of farms with high sustainability – a little over 5 times. This means that many farm managers do not have an accurate idea of the real level of (economic) sustainability of the farms they manage. Therefore, holistic “external” sustainability assessments, such as the one in this study, would greatly improve the awareness, self-confidence and overall management of a significant part of the country’s farms.

Figure 7

Comparison of the multicriteria assessment with the self-assessment of the managers of the sustainability of the agricultural holdings in Bulgaria



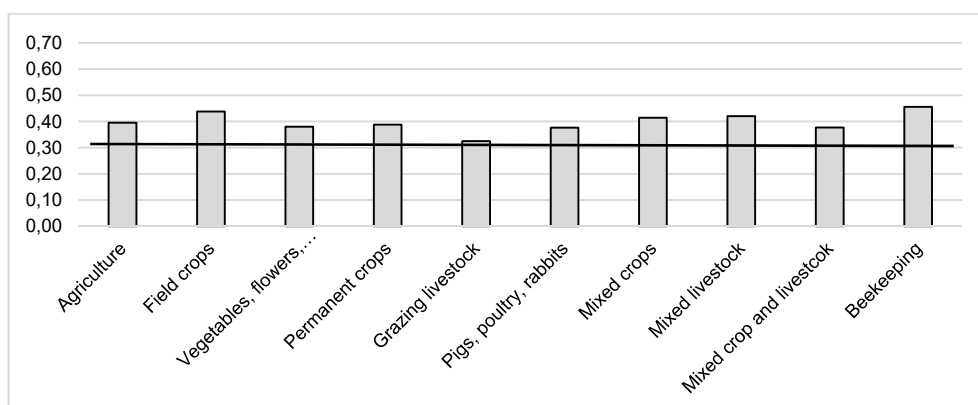
Source: Author's calculations; Survey of agricultural producers, 2020.

Level of competitiveness of farms with different specializations

There is a significant variation in the level of competitiveness of agricultural holdings with different production specializations (Figure 8). The farms with the highest *good level of competitiveness* are in the beekeeping sector (0.46), followed by those specialized in field crops (0.44), mixed livestock (0.42), and mixed crop production (0.41). The farms in a number of major agricultural sub-sectors are with a good level of competitiveness, however, it is below the national average – permanent crops (0.39), vegetables, flowers and mushrooms (0.38), pigs, poultry and rabbits (0.38), and mixed crops and livestock (0.38). The farms specializing in grazing livestock are the least competitive with a *low level* (0.32) of competitiveness.

Figure 8

Competitiveness of agricultural holdings with different specializations in Bulgaria



Source. Author's calculations.

The competitiveness of agricultural holdings in Bulgaria

The analysis of the individual aspects of the competitiveness of farms with different specializations shows that most types have low economic efficiency, which is the largest contributor to the deterioration of their competitiveness (Figure 9). Only the farms specializing in field crops have good economic efficiency.

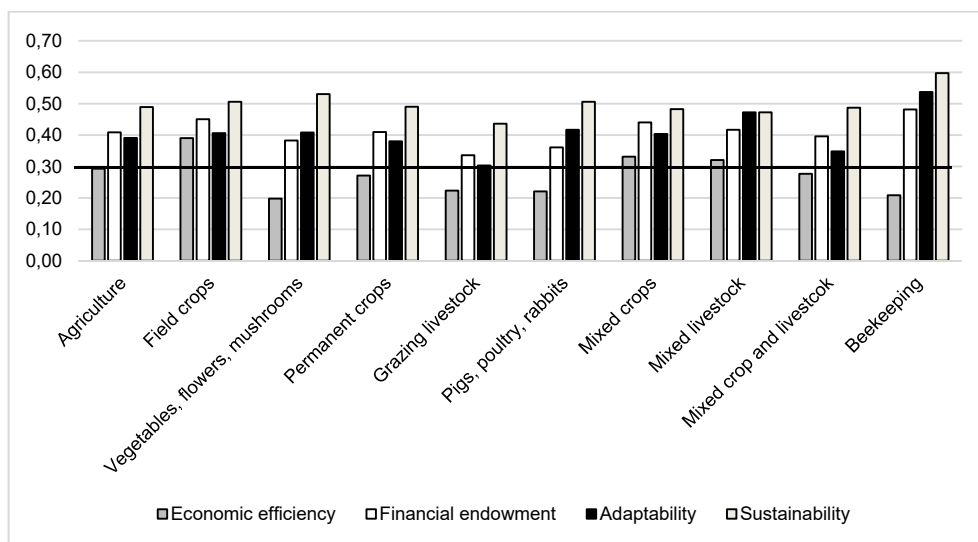
The farms specialized in beekeeping (0.48) have the best financial endowment, followed by field crop (0.45) and mixed crop farms (0.44). The financial endowment of farms specialized in mixed crops and livestock production (0.4), vegetables, flowers and mushrooms (0.38), pigs, poultry and rabbits (0.36) and grazing livestock (0.34) is below the national average, the latter group being close to the low level.

The farms specialized in beekeeping (0.54), mixed livestock (0.47) and pigs, poultry and rabbits (0.42) have the highest adaptability. The potential for adaptation to changes in the market, institutional and natural environment of farms specializing in permanent crops (0.38) and mixed crops and livestock (0.35) is below the industry average, while that of farms with grazing livestock is at a low level (0.3).

The sustainability of most types of farms is relatively good and close to the national average. The farms with the lowest sustainability within the limits of the good level are those specialized in grazing livestock (0.44). The sustainability of the other groups of farms is at a high level, with a maximum value for those specialized in beekeeping.

Figure 9

Level of competitiveness of agricultural holdings with different specializations by main criteria for competitiveness in Bulgaria



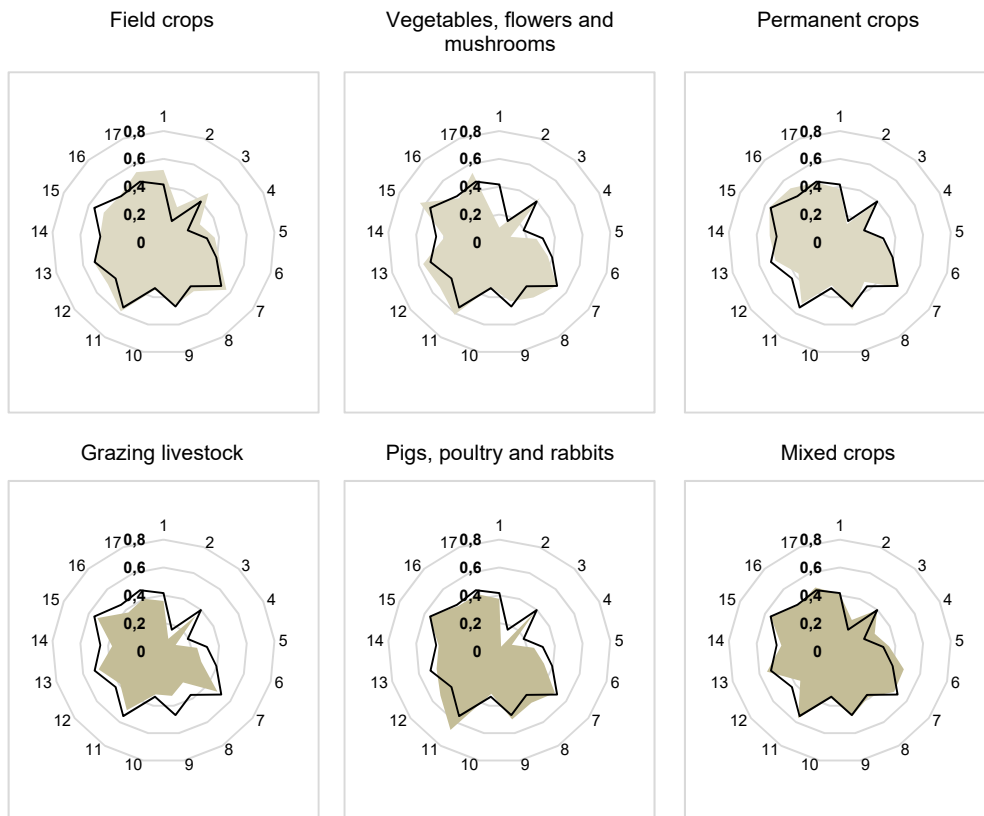
Source. Survey of agricultural producers, 2020.

Most of the indicators of competitiveness of farms specializing in *field crops* have values higher than the national average (Figure 10). These farms have lower than average levels only in terms of their adaptability to the institutional environment and the efficiency of service provision.

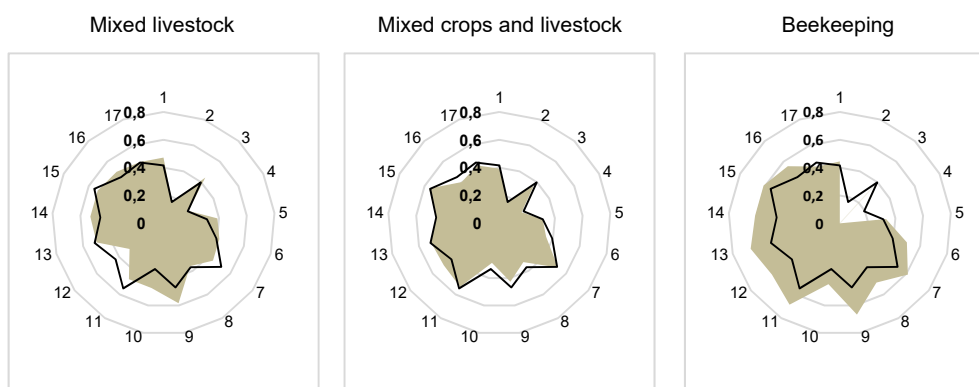
The competitiveness of farms specializing in the cultivation of field crops is maintained by high productivity, liquidity, financial autonomy, adaptability to the market environment, efficiency in the supply of land and natural resources, materials, machinery and biological resources, finance, services and innovation, and efficient realization of products and services. The main factors for reducing the competitiveness of farms with field crops are low productivity (0.27) and profitability (0.29), as well as adaptability to the natural environment (0.35) that is close to the low level.

Figure 10

Level of the indicators* for competitiveness of agricultural holdings with different specialisations in Bulgaria (the average for agriculture is presented in black)



The competitiveness of agricultural holdings in Bulgaria



* 1 – Productivity of labor; 2 – Productivity of land; 3 – Profitability; 4 – Income; 5 – Financial capability; 6 – Liquidity; 7 – Financial autonomy; 8 – Adaptability to the market environment; 9 – Adaptability to the institutional environment; 10 – Adaptability to the natural environment; 11 – Supply of land and natural resources; 12 – Labor supply; 13 – Inputs supply; 14 – Financial supply; 15 – Supply of services; 16 – Supply of innovations; 17 – Marketing of products and services.

Source. Author's calculations.

Many of the indicators of the competitiveness of farms specializing in the cultivation of *vegetables, flowers and mushrooms* have values lower than the national average (Figure 10). However, in many respects, these farms have higher than average positions – in terms of their profitability, adaptability to the market environment, efficiency in the supply of land and natural resources, labor, materials, machinery and biological resources, services, and the sale of products and services. The main factors for maintaining the competitive position of this type of farm are high financial autonomy, efficiency in the supply of land and natural resources, labor, materials, equipment and biological resources, services and the sale of products and services. The main factors for reducing their competitiveness are low labor productivity (0.11), land productivity (0.16), profitability (0.09), financial capability (0.27) and adaptability to the natural environment (0.33).

The majority of indicators for the competitiveness of farms specialized in the cultivation of *permanent crops* have values lower than the national average (Figure 10). However, in some areas, these farms have better-than-average positions, such as in terms of their financial autonomy, adaptability to the institutional environment and their efficiency in the supply of finance, services and innovation. The competitiveness of this type of farm is maintained by high financial autonomy, adaptability to the institutional environment, efficiency in the supply of land and natural resources, services and innovation. The most important factors for the deterioration of the competitive position of the farms specializing in the cultivation of permanent crops are low productivity (0.14), profitability (0.19), financial capability (0.3), adaptability to the market environment (0.33) and the natural environment (0.31).

All indicators of the competitiveness of farms specializing in *grazing livestock* have values lower than the national average (Figure 10). The low productivity (0.09), profitability (0.1), financial capability (0.24), liquidity (0.28) and adaptability to the market (0.27), institutional (0.33) and natural (0.32) environment contribute the most to the unsatisfactory competitiveness of this type of farm. The main factor for raising their competitive position is the high efficiency in their supply of services.

Most of the competitiveness indicators of farms specializing in *pigs, poultry and rabbits* have values lower than the national average (Figure 10). However, in several respects, these farms have better-than-average positions, such as in terms of their adaptability to the market and institutional environment, and their efficiency in the supply of land and natural resources, labor and services. The most important factors for maintaining the competitiveness of this type of farm are the high efficiency in the supply of land and natural resources, labor and services. Low productivity (0.03), profitability (0.1), financial capability (0.25), liquidity (0.33) and adaptability to changes in the natural environment (0.31) are critical for maintaining the competitive positions of farms specializing in pigs, poultry and rabbits.

Many of the indicators of the competitiveness of farms specializing in *mixed crop* production have values lower than the national average (Figure 10). However, in many areas, this type of farm has relatively better-than-average positions, such as in terms of its profitability, financial capability, liquidity, adaptability to the market, institutional and natural environment, and efficiency in the supply of land and natural resources, materials, equipment and biological resources, as well as in the realization of products and services. Central to maintaining the competitiveness of these farms are their high efficiency in the supply of land and natural resources, materials, machinery and biological resources and services. At the same time, however, the competitive position of mixed crop farms is compromised by low productivity (0.24) and income (0.28), and a close-to-low level of adaptability to changes in the natural environment (0.34).

Many of the competitiveness indicators of *mixed livestock* farms are higher than the national average (Figure 10). The farms specialized in this field are superior to other farms in terms of their productivity, profitability, financial capability, liquidity, adaptability to the institutional and natural environment, efficiency in the supply of finance and innovation, as well as in the sale of products and services. The other indicators of competitiveness of this type of farm are lower or around the average levels for the country. The high adaptability to the institutional environment and the efficiency in the supply of finances and services contribute the most to maintaining the competitive positions of the mixed livestock farms. At the same time, however, the indicators of productivity (0.17), profitability (0.2) and efficiency in labor supply (0.31) are low and limit the improvement of the overall competitiveness of these farms.

Almost all indicators of the competitiveness of *mixed crop and livestock* farms are lower or close to the national average (Figure 10). These farms are above average only in terms of their financial autonomy and their efficiency in the supply of labor and services. High financial autonomy and efficiency in the supply of land and natural

resources, materials, machinery and biological resources and services contribute the most to maintaining the competitive position of this type of farm. At the same time, low productivity (0.17), profitability (0.18), financial capability (0.31), and adaptability to changes in the market environment (0.33) and the natural environment (0.29) are critical for the competitiveness of mixed crop and livestock farms.

Almost all indicators of the competitiveness of farms specializing in *beekeeping* are higher than the national average, with the exception of the indicators of productivity, profitability, income and efficiency in the sale of products and services (Figure 10). The competitiveness of this type of farm benefits from its high level of financial autonomy, adaptability to the institutional environment, efficiency in the supply of resources, services and innovation. At the same time, however, low productivity and profitability are the factors that worsen the competitive position of beekeepers.

The assessment of the competitiveness for agricultural holdings shows that the majority of those specialized in *field crops* (62.5%) and *mixed livestock* (72.22%) have a level of competitiveness above the national average (Figure 4). The lowest share of farms with competitiveness exceeding the national average is in the sectors of *grazing livestock* (14.1%), *mixed crops and livestock* (19.64%), *mixed crops* (24.44%) and *beekeeping* (one third).

There are also big differences in the share of farms with different types of specializations which exceed the average level of competitiveness for their respective sub-sector (type). While farms specialized in field crops 58.33% are competitive above the average for this sector, in the case of mixed crop and livestock farms they are only 19.64% (Figure 4). The share of farms with a level of competitiveness superior to that of the grazing livestock sector (21.79%) and the beekeeping sector (one third) is also very low.

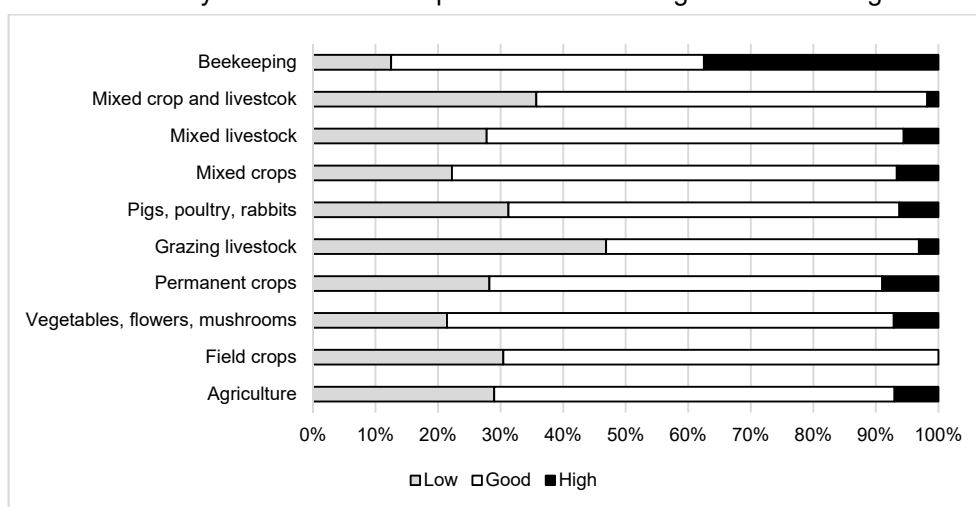
The largest share of farms with high competitiveness is in the sectors of beekeeping (one third), field crops (29.17%), pigs, poultry and rabbits (a quarter) and mixed livestock (22.22%); and the smallest share is occupied by farms specialized in grazing livestock – only 1.28% (Figure 3). At the same time, the share of farms with low competitiveness in each type of specialization is significant – field crops, pigs, poultry and rabbits, and mixed crops and livestock make up 37.5% each; vegetables, flowers and mushrooms make up 36.67%, permanent crops and bees make up 33.33%, mixed crops make up 28.89%, and grazing livestock – 21.79%. Only in the group of mixed livestock farms there are no ones with low competitiveness.

There is a discrepancy between the assessments of the level of competitiveness in the present analysis and the self-assessments of the managers of the surveyed farms with different specializations (Figure 11). While the majority of beekeepers (37.50%) believe that their farms are highly competitive, in other groups of farms this percentage is much lower – from 1.8% (mixed crops and livestock) to 9% (permanent crops). None of the managers operating in the field crops sector puts their farm in the group of the highly competitive ones. At the same time, the share of managers who assess their farm as having a low level of competitiveness is large – 30.43% for field crops, 21.43% for vegetables, flowers and mushrooms, 28.21% for permanent crops,

46.88% for grazing livestock, 31.25% for pigs, poultry and rabbits, 22.22% for mixed crops, 27.78% for mixed livestock, 35.71% for mixed crops and livestock, and 12.5% for beekeeping. Therefore, independent multi-criteria evaluations such as those in the present study would improve the awareness and management of farms that overestimate or underestimate their actual competitiveness.

Figure 11

How do you assess the competitiveness of the agricultural holding?



Source. Survey of agricultural producers, 2020.

The survey of managers found that there are large differences in the share of farms with each type of specialization with different levels of competitiveness indicators. A significant part of the farms in all subsectors have productivity and profitability well below the national average (Table 3). In addition, a large proportion of farms specializing in permanent crops, pigs, poultry and rabbits, and beekeeping have low productivity and profitability.

The largest share of farms with low financial capability is in the following sectors: vegetables, flowers and mushrooms (46.43%), permanent crops (40.26%), grazing livestock (51.61%), pigs, poultry and rabbits (50%), and beekeeping (44.44%) (see Table 4). Most farms with high dependence on external financing (loans, subsidies, etc.) are in the groups of grazing livestock (31.25%), mixed crops (27.91%) and mixed livestock (27.78%). The most significant is the share of farms with low ability to pay their current obligations, which fall in the sectors: vegetables, flowers and mushrooms (31.03%), grazing livestock (43.75%), pigs, poultry and rabbits (every third) and mixed crops and livestock (32.14%).

Many farms with different types of specializations have insufficient potential to adapt to changes in the market, institutional and natural environment (see Table 3).

The largest share of farms with low adaptability to changes in the market environment (demand, prices, competition, etc.) are in the following sectors: permanent crops (37.66%), grazing livestock (every second), mixed livestock, mixed crops and livestock, and beekeeping (one third each). Most farms with insufficient adaptability to the institutional environment and restrictions (state and European requirements for quality, safety, environment, etc.) are among those specializing in grazing livestock (34.38%), and mixed crop and livestock farms (23.21%). There is also a significant share of farms with low ability to adapt to changes in the natural environment (rising temperatures, extreme weather, drought, sleet, etc.), which varies from 22.22% in the case of mixed livestock and bees, to 46.43% in the case of all mixed crop and livestock farms in the country.

The survey found that the largest share of farm managers who believe that their farms have low sustainability in the medium term are among those specializing in field crops (20.83%), grazing livestock, and pigs, poultry and rabbits (31.25%) (Figure 4).

The survey also found that a significant proportion of farms specializing in permanent crops (35.9%), grazing livestock (40.63%), mixed crops (37.78%) and mixed livestock (44.44%) have serious problems and difficulties in effectively providing the needed labor force (Table 4). There are also many farms that face serious problems and difficulties in effectively providing the necessary funding – 31.03% of all farms specialized in growing vegetables, flowers and mushrooms, 35.48% of those specialized in grazing livestock, and 28.89% of those specialized in mixed crops. In addition, a large part of farms specializing in grazing livestock (43.75%), pigs, poultry and rabbits (31.25%), and mixed crops and livestock (32.14%) are faced with serious problems and difficulties in effectively providing the necessary innovations and know-how. There are also many farms specializing in permanent crops (22.08%), grazing livestock (25.81%), pigs, poultry and rabbits, and beekeeping (a quarter each), which face serious problems and difficulties in the effective sale of their products and services.

Conclusion

The multi-criteria assessment of the level of competitiveness of agricultural holdings in Bulgaria found that it stands at a good level, as the low adaptive potential and economic efficiency contribute to the greatest extent to diminishing the competitiveness of local producers. Particularly critical for maintaining the competitive position of farms are the low productivity, profitability, financial capability and adaptability to changes in the natural environment, and those are the areas in which public support for farms and farm management development strategies should be directed. More than a third of all farms in the country have a low level of competitiveness, and if timely measures are not taken to increase their competitiveness by improving their management and restructuring them by providing adequate state support, etc., a large part of Bulgarian farms will cease to exist in the near future. The most competitive are the farms in the beekeeping sector, followed by those specialized in field crops, mixed livestock and mixed crop production, and

the least competitive are the farms specialized in grazing livestock. The proposed approach to assessing the competitiveness of farms should be refined and applied more widely and periodically. The analyses should also cover holdings of different juridical type, size, ecological and geographical location, etc. The accuracy and representativeness of the information used should also be enhanced by increasing the number of surveyed farms, applying statistical methods, special “training” of those conducting and participating in the surveys, etc. All this requires closer cooperation with producer organizations, the National Agricultural Advisory Service (NAAS) and other stakeholders, as well as improvements in the system for collecting agricultural information in the country.

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