

A Study of the Yield of Honey in Farms from North-Eastern Bulgaria

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Abstract

The aim is to study the prices, cost and profitability of honey from the Ruse region. A serious problem has been defined for honey, which is a major product of regional beekeeping, respectively its profitability - steadily declining prices do not cover the rising costs of production and sale. The study found that the average prices of the online segment of organic honey compared to the same offline segment in packages of 1 kg have a difference of almost 2 times, and in the smallest cuts 3 times. The gross profit (margin) of the regional honey of the B2B offline markets in the biological and conventional segment for 2020 is negative. The study found that own B2C online channels in the conventional segment achieve a net return of 48 BGN/year per beehive, and in the biological segment - 97.92 BGN/year per beehive. The latter provides 150 beehives with a net income of 1224 BGN/month, which is the yield on the sale of organic honey on the offline B2C markets with 950 beehives. Marketing strategies of beekeeping farms in the Ruse region are needed to achieve competitiveness and profitability at the sectoral and regional level.

Keywords: prices, cost, B2B and B2C markets, offline and online markets, conventional and organic segments.

JEL: M31; Q13.

The importance of the study of prices and costs originates from their basic role in the profitability of honey, which is a major product of Bulgarian beekeeping, incl. the Ruse region, which is in North-Eastern Bulgaria. Since Bulgaria's accession to the EU in 2007, there has been a steady increase in the prices of factors and means of production in Bulgarian agriculture, incl. beekeeping. At the same time, during this period (2007 - 2020) there was a steady decline in honey prices in the national organizational (B2B) and consumer (B2C) markets as well as their conventional and bio segments. National offline (real) organic honey markets have been developing since 2010, with rapeseed and sunflower honey being considered non-organic. The online (virtual) markets for organic honey in Bulgaria started their development after 2015 and only B2C.

B2B online markets for honey in Bulgaria are not yet developed, so we will only analyse B2C online markets for conventional and organic honey. At the beginning of the studied period, the prices of conventional and organic honey were higher and the cost was lower. At the end of the period they were similar,

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which leads to negligible or negative profits and some bee farms go bankrupt. This shows the existence of a serious problem with honey, which is a major product of national and regional beekeeping, respectively its profitability - steadily declining prices do not cover the rising costs of its production and sale.

The urgency of the problem is complemented by the important role of the beekeeping sector in the EU's green economy, given the ecosystem pollination service to ensure food security. The green economy has an important role to play in sustainable development, generating business activity and growth in a number of industries and services, but requires positive financial motivation. Ensuring innovation and the formation of bee products with high added value, as well as access to international and regional markets relies on positive returns. Regional beekeeping is under the influence of global threats and opportunities, adaptation to which requires financial resources. Survival, prosperity and the achievement of supranational competitiveness require a positive return.

In the period 2010 - 2020, no studies have been established on the profitability of honey-producing farms in North-Eastern Bulgaria, which borders South-Eastern Romania. There is information on honey prices and costs at EU and Member State level, but at farm level there are no comparable data on costs and profitability. According to the European Commission for 2018, the average production costs in the EU are 3.90 EUR/kg, in Romania 2.58 EUR/kg and 1.31 EUR/kg in Bulgaria. The average price of honey in the B2B markets in Bulgaria and Romania is the lowest in the EU - 3.52 and 2.25 EUR/kg (European Commission, 2019). The prices in the B2C

markets are the highest in the North-Western part of the EU, where they reach 20 EUR/kg, and in Bulgaria they are the lowest in the EU - 4 EUR/kg, with the smallest difference in the prices of organic and conventional honey.

The aim is to study the prices and cost of honey from the Ruse region in offline and online markets. According to the set goal they will be analysed as follows: 1. the sources of information about the prices and the prime cost, 2. the prime cost and the prices on the B2B and B2C offline markets, 3. the prime cost and the prices of the B2C online markets, 4. the profitability of B2C online markets of conventional and organic honey.

Information sources on prices and cost

The European Commission (EC) seeks to collect and publish more complete data on the purchase prices of agricultural products in key agricultural productions in the EU member states in order to increase the transparency in the food chain. The strive to achieve greater transparency of prices and pricing of agricultural products aims to improve business decisions and confidence in pricing throughout the food chain. The differences in purchase and final selling prices provide information on intermediary costs and profits - transport, insurance, storage, etc., between farmers and buyers. The collection and publication of cost and price information improves the profitability of farms and access to markets for bee and other products.

The Ministry of Agriculture, Food and Forestry (MAFF), in accordance with the Ordinance on the terms and conditions for collecting market information on agricultural products, collects such information, which it sends to the EC for implementation of measures included in the Common

Agricultural Market Organizations, law on its implementation. MAFF collects price information on cereals, fresh fruits, vegetables, milk and dairy products, which is sent within the deadlines and in the manner specified in EU law. It also collects price information for other agricultural products according to the goals and the implemented policies. The lack of price information increases the volatility and worsens the functioning of agricultural markets, incl. bee products.

Making well-founded pricing decisions requires appropriate information provision. The collection of timely and accurate price information is carried out through price studies and price information systems. Price information is extracted from international and national institutions, branch organizations, agricultural markets, etc., after that it is sorted, processed and analysed. It would be very difficult for a beekeeping farm to build an independent price information system or to carry out independent price studies, because they require investments and competencies that it does not have. This requires integration with other bee farms for their construction and implementation in practice.

Price surveys may be part of the information system of associated holdings or may be conducted separately and independently. The last one has a preventive role and importance for protection against threats and risks, as well as the use of opportunities, because it provides up-to-date and adequate pricing and other information. In the absence of such a system, the costs, scope and frequency of price studies will be much higher, because they will be the only source of price information. The price information system has a preventive role by providing a continuous flow of different price information, and price

studies define and collect information for solving a specific well-defined price problem.

Increasing the level of security, reliability and most importantly, comparability of the information gathered from price surveys and price information systems is based on the use of international sources, which offer exceptional richness in terms of volume and nature of data. These sources are related to the activities of major international organizations in various fields of activity - regional economic commissions and other specialized bodies of the United Nations (UN), the Organization for Economic Cooperation and Development (OECD), the World Trade Organization (WTO), the International Bank for Reconstruction and Development (IBRD), the International Monetary Fund (IMF), the International Finance Corporation (IFC), the European Development Fund, etc.

The advantages of the price information, which come from the international organizations, are expressed above all in its system, uniform methodology of collection and processing, which makes the data for the prices completely comparable. Another advantage is the easy accessibility and relative economy of using such information, which is also published online by international institutions. Surveys on the Internet allow fast, low-cost, equal access to information resources and constant contact with respondents, electronic data collection and independence from time differences (Lyubenov, 2016). International databases and the Internet have proven and provided promising opportunities for obtaining up-to-date price information.

Registered agricultural farms, incl. beekeeping ones under Ordinance № 3 of 29.01.1999, may receive information on the markets and prices of agricultural products from the National Agricultural Advisory Service

(NAAS) at the Ministry of Agriculture and Food. The Ministry of Agriculture publishes on its website weekly price analyses for basic food products (www.mzh.government.bg, 05.09.2019) - flour type "500", eggs, refined sunflower oil, chicken, white crystal sugar, lamb, etc. The various branches and services in the structure of the MAFF, develop pricing methodologies and use price information from certain representative markets, the Agricultural Market Information System (AMIS), the National Statistical Institute (NSI) and others according to their tasks.

The State Commission for Commodity Exchanges and Markets (SCCEM) at the Council of Ministers collects, processes and promotes information on exchange and market prices (www.dksbt.bg, 05.09.2019). It has an information system that allows the daily collection of up-to-date information on trade in commodity markets, producer markets and commodity exchanges in the country. The information is analysed and published on the SCCEM website and in its newsletter, and upon request is provided on paper or electronic media. SCCEM prepares analyses of the movement of wholesale prices of foodstuff, fruits and vegetables sold at commodity markets and markets of producers in Bulgaria - by regions, incl. the Ruse region.

AMIS is aimed at assisting the public administration bodies in carrying out their activities for the implementation of agricultural and other activities policies under market conditions (<https://sapi.bg>, 05.09.2019). It prepares and provides price inquiries when conducting procedures and tenders under the Public Procurement Act. AMIS also supports the activities of the State Financial Control, the Judiciary and other state institutions. The company works in support of farmers, providing them with information in order

to improve the selling of the products. The collected database and information give the opportunity to make official inquiries by regions and for past periods.

There is no other such specialized and functioning information system as AMIS in Bulgaria which monitors the prices of over 900 products throughout the food chain. AMIS collects information on purchase, wholesale and retail prices, providing periodic price information and performing specific tasks for most sectors of agriculture, according to the requirements of MAFF and other institutions in terms of nomenclature, units of measurement, quantity, quality, etc. AMIS prepares commodity analyses, conducts a study of the state of the agricultural land market by years, publishes a grain bulletin in Bulgarian and English. AMIS publishes weekly newsletters on the prices of milk and dairy products, meat and local products, fruits and vegetables, etc.

Information on direct and indirect price regulation also concerns cost. Prior to our accession to the EU, until 2007 the state controlled over 20% of the prices in the local economy (Hristova et al., 2004), and redistributed over 35% of the GDP. Today, direct and indirect price regulation exceeds these levels. The need for state regulation in the field of prices is determined by reasons such as the fight against inflation, the existence of monopolies, the provision of socially disadvantaged sections of the population, technical improvement of production, cessation of non-environmental production and others. To the abovementioned we can add the presence of imperfect price information and markets, greater risk and uncertainty, environmental protection, ensuring food and income security and profitability for farms.

Most of the prices in the agricultural sector are not a case of market mechanisms, but have a strong influence on the prices of bee products. European and national policies have a direct impact on the pricing of a number of sectors such as electricity, heat, natural gas, water supply and sewerage services, communications services, medicines, taxi services and others. There is a direct influence on the formation of prices of agricultural land and some agricultural products in the agricultural sector. The EU CAP uses intervention, threshold and indicative prices (Lyubenov, 2012) for certain agricultural products, and for the new reference period 2014-2020 relies mainly on intervention prices, for products with a large role in food security such as wheat, etc., which do not include bee products.

The scale of indirect regulation of prices of locally produced and imported products and those intended for export is much more comprehensive and diverse than direct methods and forms of price regulation. All directly regulated prices indirectly affect the pricing of many bee and others products. States indirectly regulate prices through economic mechanisms such as taxes, fees, duties, subsidies and more. National agricultural policies, incl. and the EU CAP apply measures of different nature such as maintaining certain internal prices for farmers, subsidizing production and purchasing resources, providing direct aid, structural adjustment aid, import restrictions, etc., which have an indirect impact on the formation of bee prices and many other products.

Direct and indirect regulation of prices and pricing increases volatility, and government spending, creates deficits or surpluses, disrupts market self-regulation. It gives the wrong price signals, as a result of which,

nationally and internationally, the production of bee and other products is carried out not where it should be, with high unit costs and large economic losses for the national and world economy. Subsidizing the production of bee products by the state increases the supply and its elasticity, but the impact on demand is significantly weaker. This leads to a "clash" between the inelastic demand for bee products and the growing elastic supply, as a result of which markets cannot balance themselves.

Subsidies have a de-stimulating effect on the market orientation of beekeeping farms and contribute to greater price volatility. Beekeeping farms plan their activities, respectively the production of certain quantities and types of bee products, not on a market basis and market prices, but according to the subsidies they can potentially absorb. Since the organizational markets for bee raw materials are close to the so-called perfect competition, pricing is determined by market forces. When beekeeping farms have set production and prices based on subsidies and costs, they will face market prices that are quite different from those planned. Price regulation and subsidies affect the cost of bee products.

In determining the cost, price information from the above sources is used. The cost of honey depends on the prices of factors (land, labour, and capital), the prices of means of production (feed, preparations, etc.) and sales prices (packaging, transport, etc.). At a national level their prices are similar, but at a regional level the differences are in the amount of factors and means of production used, caused by natural, organizational, technological and other conditions. Therefore, obtaining information about the cost of honey at a regional level - Ruse, is based on specific

studies in regional beekeeping, i.e. of its farms, branch unions, specialized regional institutes.

The data on honey prices are obtained from the above-mentioned government and market institutions, and the sources of information on the cost of regional honey includes them, beekeeping farms in the Ruse district and regional branch unions. The methods used are retrospective analysis of prices and costs, monitoring and empirical study of the costs of regional farms and focus groups with representatives of regional industry unions and beekeepers in training in the system of the National Agricultural Advisory Service. A matrix for the prime cost of bee honey has been developed (Lyubenov et al., 2021), in which the prime cost of conventional and organic honey for farms in the Ruse region has been systematized, synthesized and calculated.

Cost and prices of the B2B and B2C markets for honey

The data on the cost of conventional and organic honey in beekeeping farms in the Ruse region for the period 2011 - 2019 are based on a cluster sample of four nests from the Ruse region – the Nikolovo village, the Brestovitsa village, the Bazovets village and the Yuper village (Lyubenov et al., 2021). The results were discussed with members of the largest regional branch union, where the learners beekeepers in the National Agricultural Advisory Service expressed a similar opinion on the data obtained for the period 2010-2020. According to the objectives of the study, only the final results for the cost of the regional conventional and organic honey - bouquet will be analysed here (Table 1).

Table 1. Cost of a regional honey bouquet

Years \ Markets	Production, BGN/kg		Full, BGN/kg	
	Conventional	Biological	Conventional	Biological
2010	2.37	4.09	3.67	5.39
2020	3.91	6.09	5.26	7.44

At the beginning of the period (2010) the basic production cost of conventional honey was 2.37 BGN/kg, and of organic 4.09 BGN/kg. The main reason for its increase is the increment in the price of the labour factor and the prices of the means of production in beekeeping - feed, veterinary drugs and others. The price of labour on the basis of the minimum wage increases from 1.42 BGN/hour for 2010 to 3.66 BGN/hour for 2020 (<https://kik-info.com>, 12.12.2020), increasing 2.6 times for the period. The prices of fodder, preparations, etc., are also growing steadily, but more slowly. The rise in the prices of

factors and the means of production in beekeeping is a consequence of their upward trend in the national economy, which also increases the cost of honey.

During the analysed period (2010 - 2020) there is a lasting growth of the prices of the factors and the means of production, respectively of the prime cost of the regional honey. At the end of the period, the basic production cost in organic farms is 6.09 BGN/kg, and in conventional farms 3.91 BGN/kg, but it may be lower or higher due to changes in natural and other factors. The increase in the cost of organic honey is greater than

conventional. The production of organic honey is more unsustainable than the conventional, due to a number of limitations in biotechnology,

which aim at higher quality, but lead to lower yields, which is why the cost is not only higher but also more volatile - Table 2.

Table 2. Volatility of the cost of organic honey bouquet, (BGN/kg)

Basic cost	Correction	Real cost	Reasons	Harvests
6	1.3	7.8	Diseases, enemies, etc.	All
6	1.2	7.2	Weak families, etc.	Acacia
6	1.1	6.6	Swarming, layering, etc.	Linden
6	1	6	Developed families (base)	All

The production cost (Table 2) is the highest before and after the last harvest, due to higher costs for feeding and inspections - labour, feed, veterinary drugs and others. It is affected by climate change, costs for biological certification and transport, subsidies, labour costs and means of production - hives, branches, equipment and more. In the second half of the analysed period the subsidies for organic beekeeping decreased, and the prices of factors and means of production increased. The end of the period is accompanied by more unfavourable climate changes, which lead to less grazing for bees and higher mortality after overwintering. Their variability increases not only the cost, but also its volatility.

The cost of organic honey depends on the quantity and quality of funds, labour, technology, production management and their prices. The cost can be reduced in two main ways - extensive and intensive (Lyubenov, Naneva, 2006). The first is based on the quantity of factors through which the advantages of wholesale over small-scale production are realized, and the second on the quality of factors - increasing the average

yield of hives, selection of bee colonies, improving the quality of honey, fuller load of available capacities, application of better technologies, etc. The deepening processes of specialization, integration and concentration in beekeeping reduce the production and full cost.

Table 3 presents the prices of honey on the national offline markets in 2010, and in Table 4 - the prices in 2020. Throughout the ten-year period (2010 - 2020) there is a steady decline in honey prices in all markets and segments. The decrease of the average prices for the analysed period is the largest in the biological segments of B2B (2.2 BGN/kg) and B2C markets (1.4 BGN/kg), and in the conventional segments of B2B (0.8 BGN/kg) and B2C markets (1 BGN/kg), it is about twice less. A retrospective analysis of average honey prices in national offline markets and their organic and conventional segments over the last decade shows a more pronounced and sustained decline in prices in organic segments, however the change in market prices by type of honey is different.

Table 3. Prices of honey on offline markets in 2010

Markets and types of honey	B2B market, BGN/kg		B2C market, BGN/kg	
	Conventional	Biological	Conventional	Biological
Acacia	7	10	12	14
Linden	6	7	10	12
Sunflower	5	-	8	-
Bouquet	4.5	6.5	7	9
Rapeseed	4	-	6	-
Average	5.3	7.8	8.6	11.7

The prices of the bee honey type bouquet are below the average market prices in all segments for the whole analysed period. They are lower than the average prices, but their decline is smaller than that of honey type acacia and linden, as the B2C markets remain at the same level in both segments (conventional - 7 BGN/kg, organic - 9 BGN/kg) for the whole period. The market prices of conventional acacia honey also remain stable on the B2B markets for the whole period, but on the B2C markets they are declining, as the decline in linden honey is higher in the organic segments. Based on the data from Table 1, Table 3 and Table 4 we can determine the profit of a honey bouquet from the Ruse region - Table 5. On the B2B markets for 2020 the profit is negative for all segments, and

on the B2C markets it is positive, but with a steady downward trend - Figure 1.

The data from Figure 1 show a tendency towards permanent and sustainable decrease of the profit from regional bee honey, which is the main product of beekeeping from the Ruse region. The reasons for this are the fall in market prices and the rise in cost. Honey prices are international, and are determined by large producer and processor countries. Bulgaria is not among them, so it cannot influence honey prices. The cost of honey will continue to rise due to the increasing climate problems, diseases and pests, as well as to the natural rise in prices of factors and means of production in beekeeping. Hive subsidies are needed for pollination throughout the EU sector, not only for its survival but also to ensure food security.

Table 4. Prices of honey on offline markets in 2020

Markets and types of honey	B2B market, BGN/kg		B2C market, BGN/kg	
	Conventional	Biological	Conventional	Biological
Acacia	7	7	10	12
Linden	4.8	5.30	8	10
Sunflower	3.5	-	7	-
Bouquet	3.8	4.5	7	9
Rapeseed	3.3	-	6	-
Average	4.5	5.6	7.6	10.3

Table 5. Net profit of a regional honey bouquet in offline markets

Years \ Markets	B2B market, BGN/kg		B2C market, BGN/kg	
	Conventional	Biological	Conventional	Biological
2010	2,13	2,41	3,33	3,61
2020	-0,11	-1,59	1,74	1,56

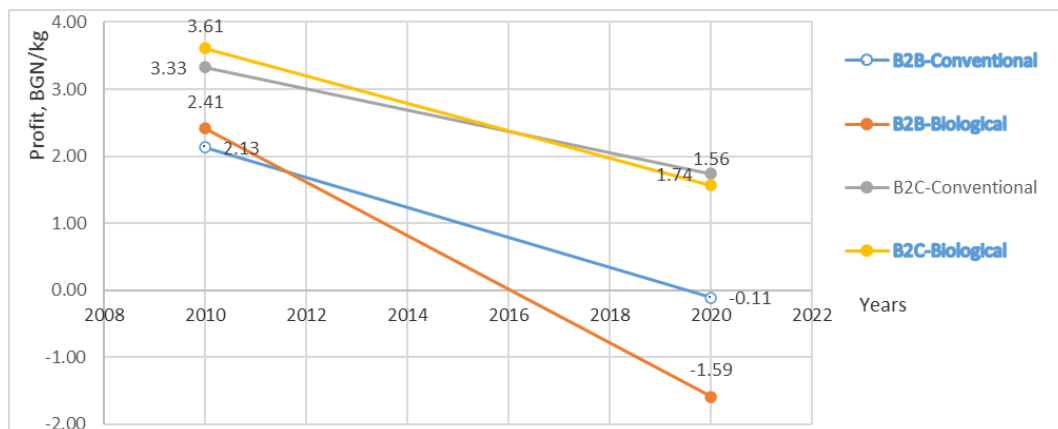


Figure 1. Profit trend of regional honey in offline markets

Cost and prices of B2C online markets honey

Access to online markets requires some additional competencies, respectively costs and benefits. Farms must be registered under Ordinance 26 for direct deliveries, as well as conduct tests for the quality of each batch of honey. They have higher costs for packaging, labelling and marketing in general - online market research, online advertising, PR and more. The logistics costs for transport and the costs for site, information service, etc. are also higher. Therefore, the total cost in the own online channels for organic honey is about 10 BGN/kg (Lyubenov, 2020), and in the channels for conventional honey about 8 BGN/kg. Online channels allow personalized and direct marketing without intermediaries, brand building and higher profits.

Offline markets for honey are growing very slowly by 1-2% per year, while online markets are growing many times more. In addition, the online and organic honey markets are in symbiosis, which outlines serious prospects given the low prices in offline markets. In 2020, organic honey will be offered on the online markets in packages of about 1/3 kg at an average market price of about 10 BGN/kg (Table 6). Larger packages are more limited in terms of supply, types, etc., and the average market prices for packages of 1 kg are about 20 BGN (<https://zelen.bg>, 27.07.2020; <https://shop.biohotel-bg.com>, 27.07.2020), but fluctuate in a wider price range compared to smaller cuts. The indicated prices of organic honey on the online markets include VAT, but not transport and other costs inherent in online deliveries.

Table 6. Prices of organic honey in packages around 1/3 kg

Online stores Types of honey	https://harmonica.bg 0.310 kg	https://zelen.bg 0.350 kg	www.balevbiomarket.com 0.350 kg
Herbal (bouquet)	8.86	8.5	9.99
Linden	10.11	10	11.49
Acacia	11.65	12.35	11.99
Average	10.2	10.3	11.16

The prices of conventional honey in online stores of traders with a wide product range start from those on the national offline market - about 10 BGN/kg (<https://bazar.bg>, 27.07.2020; www.olx.bg, 27.07.2020). The specialized online stores of traders (www.pchelenmed.com, 27.07.2020) offer conventional honey at higher prices - about 11.6 BGN/kg. The online stores of producers (<https://radihoney.com>, 27.07.2020; www.medec.bg, 27.07.2020) offer conventional honey without a biological certificate at prices around 12-14 BGN/kg. The highest prices of organic honey without a biological certificate are around 15 BGN/kg (<http://otmanastira.com>, 27.07.2020), because they are based on proven ecological purity, personalization and quality. It is logical that the prices of certified organic honey should be even higher.

In Table 7 the results of the price survey of the consumer online markets of conventional and organic honey of Bulgarian producers in 2020 are synthesized. The comparison of the prices from Table 7 and Table 4 shows that the average prices on the consumer conventional online markets in the large packages are 1.72 times higher than those in the offline markets, and in the smaller packages the difference is more than 2 times. When comparing the average prices of the online segment of organic honey to the same offline segment for packages of 1 kg, the difference is almost 2 times, and for the smallest cuts 3 times. The prices of honey on the conventional and organic online markets allow a more profitable sale compared to the offline markets.

Table 7. Prices of honey in online stores of producers

Types of honey and cuts	Conventional, BGN/kg			Biological, BGN/kg		
	0,330 kg	0,5 kg	1 kg	0,330 kg	0,5 kg	1 kg
Acacia	5	8	15	12	16	22
Linden	4	7	13	11	15	20
Sunflower	-	-	-	-	-	-
Herbal (bouquet)	3,5	6	11	8	12	17
Rapeseed	-	-	-	-	-	-
Average	4,2	7	13	10,3	14,3	19,7

The study of the prices and the prime cost of honey from the Ruse region in the B2B and B2C markets with their biological and

conventional segments, allowed to establish the difference between the prices and the prime cost, i.e. gross profit (margin). For

2020, the regional honey margin on the B2B offline markets for both segments (organic and conventional) was negative. The margin in the conventional segment of the offline B2C markets is 1.74 BGN/kg, and in the biological segment it is 1.56 BGN/kg (Table 5). The largest margin is in the own online B2C markets in the biological segment - $19.7 - 10 = 9.7$ BGN/kg, and in the conventional one it is $13 - 8 = 5$ BGN/kg. Regional honey achieves a more than six times higher margin in the online B2C bio segment, and in the conventional about three times more, compared to the same offline segments.

Profitability of B2C online honey markets

Based on the data on the cost and prices of regional honey, its profitability in the B2C online markets for their conventional and biological segments has been determined - Table. 8. In the conventional online segment the net profit from a beehive is 48 BGN/year, and in the biological online segment it is 97.92 BGN/year per hive. The average gross salary in Bulgaria at the end of 2019 is 1313 BGN/month (www.investor.bg, 12.12.2020). A beekeeper can keep about 150-200 biological

beehives, of which his annual net income from his own online organic B2C market (distribution channel) at 150 hives will be 14688 BGN/year (97,92.150) or 1224 BGN/month (14,688/12), and for 200 beehives it will be 19,584 BGN/year (97,92.200) or 1632 BGN/month (19,584/12).

The profitability for B2B and B2C offline markets is calculated (Lyubenov et al., 2021), therefore here we will only analyze the results in a comparative plan compared to B2C online markets - Table 8. For the comparability of the data we will only compare the profitability of the B2C offline markets with that of the B2C online markets, and for the profitability of the B2B offline markets we will note that it is negative. In the conventional offline segment the net profit from bee honey per beehive is 15.6 BGN/year, and in the biological offline segment it is 15.5 BGN/year per beehive (Lyubenov et al., 2021). This shows an insignificant difference in profitability between the two segments (conventional and organic) in the B2C offline markets, as well as significantly lower profitability compared to B2C online markets - over 6.3 times in the biological segment.

Table 8. Profitability of regional farms in the realization of honey through own B2C online markets

	Conventional	Organic
Market Price (Pe), BGN/kg	13	19,7
Commercial cost (Sm), BGN/kg	8	10
Gross profit ($W_m = Pe - S_m$), BGN/kg	5	9,7
Tax ($T = Pe \cdot 0,2$), BGN/kg	2,6	3,94
Net profit ($W_n = Pe - S_m - T$), BGN/kg	2,4	5,76
Wn per beehive ($W_n^\circ = W_n \cdot \text{yield}$), BGN/year.	48	97,92
Wn per 1000 beehive ($W_n^\wedge = W_n^\circ \cdot 1000$), BGN/year	48 000	97 920
Profitability of turnover ($R_n = W_n/P_e$).100, %	18,46	29,24

Although the profitability of their own B2C online markets is significantly higher than that of offline markets, a negligible part of regional beekeeping farms have their own online channels because they require investment, horizontal and vertical integration. Achieving a net income of 1227 BGN/month from the sale of organic honey on the B2C offline markets requires 950 biologically certified beehives ($15,5 \cdot 950 / 12$). In comparison, the profitability of the online B2C markets at 150 hives is 1224 BGN/month. The increase in the profitability of the beekeeping farms from North-Western Bulgaria requires them to enter the B2C online markets. This requires horizontal integration between regional economies and vertical integration with other sectors - industries and services.

The beekeeping farms from the Ruse district must integrate and intensify their production through higher rates of labour productivity compared to the average salary, introduction of better technologies, etc. They must pursue a targeted sectoral policy for the introduction of beehive subsidies due to two strong arguments 1) the provision of an eco-systemic pollination service, which has a fundamental role and importance for the conservation of biodiversity and sustainable development; 2) improving the profitability of beekeeping farms, given the negative and much lower values compared to other sectors. They are also in line with the implementation of green and social agricultural policy to provide healthy food at affordable prices.

The main factors for increasing revenues are achieving higher prices, providing subsidies for pollination, etc., diversification of activities - api-tourism (tourism in the beekeeping sector), trade and others. Beekeeping farms in the Ruse district should not rely only on state and community

policies. They need to develop marketing strategies that will allow them to achieve competitiveness and profitability in the target markets. It is necessary to design bee products with high added value, which allows them to achieve higher and more sustainable prices. The beekeeping farms from the Ruse district should be integrated into a regional one, i.e. horizontal and vertical plan - with other industries to reduce the cost of bee products and achieve higher and more stable prices.

Conclusion

As a result of the study, several main conclusions were drawn:

- Information on the cost and prices of bee products is obtained and analysed from government, industry, off- and on-line sources, price research and price information systems. It increases market transparency, improves the functioning of markets and access to them, reduces price volatility, improves the confidence and balance of markets for bee products.
- Bulgarian beekeeping is a subject of two parallel and negative trends. The first is a lasting increase in the prices of factors and the means of production, and thus in the cost of the honey produced. The second is a steady decline in honey prices, which forms a serious price problem - steadily declining prices do not cover rising production costs.
- The average prices on the consumer conventional online markets in the large packages are 1.72 times higher than those in the offline markets, and in the smaller packages the difference is over 2 times. When comparing the average prices of the online segment of organic honey to the same offline segment for

packages of 1 kg, the difference is almost 2 times, and for the smallest cuts 3 times.

- The gross profit (margin) of the regional honey of the B2B offline markets in the biological and conventional segment for 2020 is negative. In the conventional segment of the offline B2C markets, it is 1.74 BGN/kg, and in the biological segment it is 1.56 BGN/kg.
- In 2020 the margin is the largest in the own online B2C markets in the biological segment - 9.7 BGN/kg, and in the conventional one it is 5 BGN/kg. Regional honey achieves a more than six times higher margin in the online B2C bio segment, and in the conventional about three times more, compared to the same offline segments.
- own B2C online channels in the conventional segment achieve a net return of 48 BGN/year per beehive, and in the biological segment - 97.92 BGN/year per beehive. The latter provides 150 beehives with a net income of 1224 BGN/month, which is the yield on the sale of organic honey in the offline B2C markets with 950 beehives.
- the tendencies of decrease in the market prices of honey and increase of the prime cost, reduce the profitability of the business. Measures are needed to increase and stabilize prices and reduce costs. Marketing strategies of beekeeping farms in the Ruse region should be developed in order to achieve competitiveness and profitability.
- horizontal and vertical integration will improve revenues by forming bee products with high added value, high and sustainable prices, income diversification, biodiversity conservation, pollination subsi-

dies. The advantages of wholesale over small-scale production will improve specialization, technology, labor productivity and yields, and reduce costs.

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