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A Study on the Financial Resources of the Businesses in terms of Cattle Breeding in Mixed Production Enterprises: The Case of Tekirdag

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Abstract

Purpose: The main purpose of this research is to present alternative solutions in this field by revealing the income and debt status of farmers with livestock income.
Design/Methodology/Approach: The main material of the research is the survey study conducted with the producers in the research area. Apart from the survey data, the data of the Business Registration System (CKS), which is registered by the Ministry of Agriculture and Forestry, were used because it is both an official registration in the field of plant production and accepted in the banking system. The records of the producers surveyed from the data of the National Milk Registration System were determined and included in the data set. Results were evaluated with descriptive statistics and Likert scale.
Findings: It is seen that farmers with low income level turn to dairy farming to increase their income. On the other hand, it has been determined that borrowing has increased in these enterprises and they are increasingly in loan relationship with banks.
Originality/Value: Short-term loan products should be offered to businesses dealing with dairy farming. It is a necessity for farmers with low income or few animals to market their products through cooperatives. In addition, improving the financial literacy level of farmers is necessary for the healthy use of finance
Key words: Farmer, agricultural input, dairy farms, financial resources

Karma Üretim Yapan İşletmelerde Büyükbaş Süt Hayvancılığı Yönüyle İşletmelerin Finans Kaynakları Üzerine Bir Araştırma: Tekirdağ Örneği
Özet

Amaç: Bu araştırmanın temel amacı, hayvancılık geliri olan işletmelerin gelir ve borçlanma durumlarını ortaya koyarak bu alanda alternatif çözüm önerileri getirmektir.
Tasarım/Metodoloji /Yaklaşım: Araştırmanın ana materyalini araştırma alanındaki işletmelerle yapılan anket çalışması oluşturmaktadır. Anket verileri dışında bitkisel üretim alanında hem resmi kayıt olması hem de bankacılık sisteminde kabul edilmesi nedeniyle Tarım ve Orman Bakanlığı tarafından kaydı tutulan İşletme Kayıt Sistemi (ÇKS) verileri kullanılmıştır. Ulusal Süt Kayıt Sistemi verilerinden anket yapılan işletmelerin kayıtları tespit edilerek veri seti içerisine alınmıştır. Sonuçlar tanımlayıcı istatistikler ve likert ölçeği ile değerlendirilmiştir.
Bulgular: Özellikle düşük gelir seviyesine sahip işletmelerin gelir artırmak için süt hayvancılığına yöneldiği görülmektedir. Buna karşın bu işletmelerde borçlanmanın artış gösterdiği ve giderek daha fazla banka ile kredi ilişkisi içerisine girdikleri tespit edilmiştir.
Özgünlük/Değer: Süt hayvancılığı ile uğraşan işletmelere daha kısa vadeli kredi ürünleri sunulmalıdır. Özellikle düşük gelirli ya da az sayıda hayvanı olan işletmelerin ürünlerini kooperatif kanalıyla pazarlaması bir zorunluluktur. Ayrıca işletmelerin finansal okur-yazarlık seviyesinin geliştirilmesi finansman kullanımının sağlıklı şekilde sürdürülmesi için gereklidir.
Anahtar kelimeler: Çiftçi, tarımsal girdi, süt işletmeleri, finans kaynaklar

1.INTRODUCTION

It is known that 2.1 million farms are registered with ÇKS in Turkey (T.C.Tarım ve Orman Bakanlığı, 2017). As of February 2021, the number of dairy farms is 1.4 million. (T.C.Tarım ve Orman Bakanlığı, 2021). On the other hand, the rate of those who do only animal husbandry among the farms in Turkey is extremely low at 5.3% (TÜİK, 2016). Considering these data, it can be said that plant and animal production in Turkey is generally done together. Cash flow of farms dealing with dairy farming is more frequent than those dealing with purely plant production. Different cash flows affect both income and finances. Within the scope of this research, a series of solutions are presented by revealing the income and borrowing status of such mixed farms and examining the preferences of the farms in these matters. In many studies conducted in this area, it has been stated that the most important cost item of the farms is feed and veterinary services, and it is stated that 61% of the total income in mixed farms comes from livestock activities (Murat and Sakarya, 2012; Gül and Göçoğlu, 2019).

When the development of the agricultural loans market between 2009 and 2019 is analyzed, the market, which was 15 billion TL in 2009 at current prices, increased to 130 billion TL in 2020 with a growth of 8.6 times within 10 years. (BDDK, 2021). In this context, it is aimed to determine the financial resources used by farms operating in the research area, to determine how the resources are used, to determine the problems of farms regarding the use of financial resources, to design and recommend alternative financial resources necessary for them to gain competitive advantage based on research data.

2.MATERIAL and METHOD

Material

The main material of the research is the survey study conducted with the farmers in the research area. Apart from the survey data, the Farmer Registration System (ÇKS) data recorded by the Ministry of Agriculture and Forestry in the field of crop production was used. Also, the records of the farms surveyed from the data of the National Milk Registration System were determined and included in the data set. Apart from these, the statistics of the Ministry of Agriculture and Forestry Tekirdağ Provincial Directorate and the agricultural statistics published every year by TÜİK were used (TÜİK,2016; T.C.Tarım ve Orman Bakanlığı Tekirdağ İl Tarım Müdürlüğü,2020). Since the surveys were conducted in 2019, an Ethics Committee Certificate was not obtained

Method

The method followed in selecting the research area

Malkara and Hayrabolu districts from Tekirdağ province were chosen as the research area. In the selection of these districts, the fact that dairy farming activities are carried out in addition to plant production played a role. Agricultural production information was obtained from the ÇKS data of all the villages of the 2 districts in the research area, the gross income amounts were calculated and they were divided into certain income layers and marked as low, middle and high income villages (In the ranking made by the World Bank income levels Turkey is in the upper middle-income countries were identified among this group of countries in income per capita in 3.976 to 12,275 dollars. Average income per capita in 2018 was calculated by TÜİK as $ 9,638 (45,463 TL). These two data were used when classifying the income levels of producers, and the net minimum wage figure for 2018 was used as the basis (TÜİK, 2019). Thus, segments corresponding to 24 minimum wages for low income level, 48 minimum wages for middle income level and 72 minimum wages for high income levels were envisaged. Thus, 0-50,000 TL for low income, 50,000-100,000 TL for middle income and 100,000 TL and above for high income were taken into consideration (Table 1). In the ranking made by the World Bank income levels Turkey is in the upper middle-income countries were identified among this group of countries in income per capita in 3.976 to 12,275 dollars. Average income per capita in 2018 was calculated by TUİK as $ 9,638 (45,463 TL). These two data were used when classifying the income levels of producers, and the net minimum wage figure for 2018 was used as the basis (TUIK,2019). Thus, segments corresponding to 24 minimum wages for low income level, 48 minimum wages for middle income level and 72 minimum wages for high income levels were envisaged. Thus, 0-50,000 TL for low income, 50,000-100,000 TL for middle income and 100,000 TL and above for high income were taken into consideration (Table 1).

Table 1. Distribution of Villages in the Research Area by Income Range

	0-2.500.000	2.500.000-5.000.000	5.000.000-10.000.000	10.000.000+	Total
Hayrabolu	4	24	13	5	46
Malkara	28	24	16	3	71
Total	32	48	29	8	117

The distribution of the producers in the research area is determined by the principle of proportional representation. In this case, two villages were selected from among high, middle- and low-income villages, and a total of 12 villages were determined, 6 villages from each district (Table 2). The proportional representation principle has been adopted in the distribution of the survey numbers to the districts. While deciding on the number of surveys on district basis, the share of the relevant district in terms of the number of producers in the population was taken into consideration. It was aimed to distribute the questionnaires determined per district equally to the villages, but it was not possible to conduct equal surveys in each village.

Table 2. Distribution of the Surveys by Income Level and Villages

District	Income Level	Village	Number of Surveys	Total
Hayrabolu	Low	Çerkezmüsellim	6	37
	Low	Şalgamlı	11	
	Mid	Büyükkarakarlı	3	
	Mid	Çeneköy	5	
	High	Canhıdır	4	
	High	Tatarlı	8	
Malkara	Low	Balabancık	18	69
	Low	Gözsüz	22	
	Mid	Alaybey	12	
	Mid	Doğanköy	6	
	High	Vakıfiğdemir	9	
	High	Yenice	2	
Total				106

The method followed in the selection of the manufacturers

For the sample size to be surveyed, according to the 2019 data from 2 districts in the research area, 1,300 farms in Malkara and 800 farms in Hayrabolu are registered to the Dairy Enterprises Association. In this framework, the main group consists of 2,100 enterprises. The calculated sample size was distributed to the districts by proportional representation method.

The following formula was used in the sample size calculation (Newbold,1995):

$$n = \frac{N \times p \times (1-p)}{(N-1) \times \sigma^2 + p(1-p)}$$

n: Population volume

N: Main set

p: The proportion of the number of enterprises with the expected characteristics in the main population (will be considered as 50% to reach the highest sample volume.)

σ^2: Population variance

Sample volume was calculated with 95% confidence interval and 9.5% margin of error. In this case, the sample size was found to be 102, and this number was completed to 106 for a balanced distribution of the questionnaire. ÇKS data was used to enrich the survey data. Especially by accessing the ÇKS records of the surveyed enterprises, anonymous data were provided and Agricultural Gross Income, Agricultural Net Income and Total Net Income calculations were made based on these data.

The method followed in data analysis

Since the survey area consists of 2 different districts and there are businesses from different income levels in each district, it is possible to evaluate and interpret the data from different perspectives. This also makes it easier to prepare more accurate determinations and recommendations, as it allows a wide range of comparisons to be made. In this respect, the research findings were classified and tabulated according to the following criteria:

Village Income Threshold: It is divided into three as Low, Medium, and High. These groups were found by calculating the incomes of the villages included in the research area before the survey. However, these do not represent the income level of the producers surveyed, but the income level of the village where that producer lives. Since the sample selection is made according to these strata, the findings are shared primarily based on these income groups in the tables.

While calculating the gross income and net income of plants, the tables of the unit income, expenditure and yield of herbal products, called the agricultural chart of 3 banks (TEB, 2019; TC.Ziraat Bankası, 2019; Denizbank A.Ş., 2019) were used. Explanations regarding data such as income and expenditure per decare included in these tables are as follows:

Income per decare: It is calculated as the gross production value. It is the value equivalent of the whole product (including consumption at source, seed allocated, etc.) purchased by farmers in a production period.

Expenditure Per Decare: Includes all crop production costs. This includes variable operating costs and active capital interest, land lease and depreciation costs for annual and perennial plants. However, the land rent is only included in the calculation for rental parcels. For the rental land prices, the average rental value in that region has been taken into consideration.While calculating the vegetative net income, the difference between the income per decare and the expenditure per decare was taken. However, in the findings regarding income, which has an important place in the analyzes within the scope of the research, non-agricultural income was excluded to show non-agricultural income separately.Livestock income was calculated using the same approach as in the vegetable gross income calculation as described above.

While calculating the livestock production value, the amount of milk produced by the producers in the last 3 years was taken as a basis for premium and the revenues from the sale of calves and fertilizers were added to the Gross production value.
The following formula was used in calculating the total net income:
Total Net Income: [Gross product (vegetable + animal + non-agricultural income)] - [(Operating expenses + Equity interest + land rent)]
The Likert scale asks participants to indicate to what extent they agree or disagree with a range of mental beliefs or behavioral belief statements about a particular object. Normally, scale format, consensus, and disagreement are balanced between scale descriptors. Named after its original developer, Rensis Likert, this scale consists of five scale descriptors: "strongly agree", "agree", "neither agree nor disagree", "disagree", "strongly disagree. Within the scope of this research, a 10-point Likert scale was used and the farmers were asked to score between 1-10. Afterwards, these scores were grouped in pairs and evaluated (Hair, Bush and Ontinau, 2002).

3.FINDINGS and DISCUSSION

Demographic Information

Of the 106 farmers surveyed, 8.5% are under 40 years old, 26.4% are 41-50 years old, 39.6% are 51-60 years old, and the remaining 25.5% are over 61 years old. . In terms of education level, 78% of the producers are primary and secondary school graduates, 21% are high school graduates and 1% are university graduates. All farmers have social security.
Enterprises Information
When the share of livestock income in the total agricultural gross income of the surveyed farms is analyzed, it is seen that 12 farms have less than 30%, 39 of them have 30-60% and remaining 55 farms have an animal husbandry income of 60% or more. Besides, it has been determined that the farms increase as the land size decreases, and 80 of the 106 enterprises consist of enterprises with 250 decares and less (Table 3).

Table 3. The change in the share of dairy farming income according to farm size

Share of Dairy Farming Income	0-50	50-100	100-250	250-500	500+	Total
0-30%	-	-	4	5	3	12
30-60%	4	5	16	10	4	39
60+%	12	21	18	4	-	55
Total	16	26	38	19	7	106

On the other hand, it is understood that dairy farms are predominantly located in villages with low income levels. While 58 (54.7%) of 106 farms are in low-income villages, 23.5% are in middle income and the remaining 21.6% are in high-income villages. At this point, it is thought that the farms also carry out dairy farming activities due to the insufficient plant production income (Table 4).

Table 4. Distribution of farms in terms of village income and share of dairy farming income

Income Level of Village	**0-30%**	**30-60%**	**60+%**	**Total**
Low	3	20	35	58
Mid	5	11	9	25
High	4	8	11	23
Total	**12**	**39**	**55**	**106**

The share of dairy farming in the total income of the enterprises is at the highest level in the villages with high- and low-income levels. However, the average total income in the low-income villages is 194.000 TL, whereas the average dairy income is 123.000 TL. It can be said that 58 farms in this group have chosen to increase their income with dairy farming. Because while the average land size of low-level enterprises is 146 decares, this figure is 296 decares in high-income villages (Table 5).

Table 5. Average income of farmers and share of dairy farming and plant production in total income

Village Income Level	Average Dairy Livestock Gross Income	Average Crop Production Gross Income	Average Non-Farm Income	Average Total Revenue
Low	123.121	65.272	6.574	194.967
Mid	91.071	69.977	7.552	168.600
High	197.887	172.002	8.657	378.545
Total	**131.785**	**89.540**	**7.257**	228.582
		Percentage Distribution		
Low	63.15%	33.48%	3.37%	100.00%
Mid	54.02%	41.50%	4.48%	100.00%
High	52.28%	45.44%	2.29%	100.00%
Total	**57.65%**	**39.17%**	**3.17%**	**100.00%**

Income and Financial Status of Farms

Debt information of 81 of the 106 farms were obtained. Considering the borrowing status of them according to their annual gross income, the ratio of debt to income decreases as the share of livestock income increases. While the debt/income ratio of low-income is 55.9%, this ratio is 66% for middle-income and 41.5% for high-income businesses (Table 6). There may be many reasons for the asymmetric data in the debt/income ratio. When the debt/income ratio is analyzed as the intersection of the village income level and the share of dairy farming income, different data stand out again. It is seen that the debt-income ratios of businesses with 30-60% dairy farming income, especially in low-income villages, are higher than the 0-30% group, unlike expected. Similarly, the debt/income ratio (57.5%) of the businesses in high-income villages with 30-60% dairy farming income is higher than the 0-30% group. In this case, it can be said that these farms work with low efficiency in livestock or plant production areas and cannot earn enough income. In other words, they are neither dairy farming nor fully plant production enterprises. As the herd size of them increases, more forage land is needed, but it is thought that they must buy feed from outside because the land size cannot be increased. On the other hand, external feed purchase both increases the cost of production and causes farms with insufficient equity capital to turn to bank-based debts (Tables 6 and 7).

Table 6. Average dairy farming incomes and debt income ratios of farmers

Share of Dairy Farming Income	Farms	Average Dairy Livestock Gross Income	Average Total Revenue	Average Total Bank Debt	Debt/Total Gross Income Ratio
0-30%	10	43.200	208.459	116.463	55.9%
30-60%	36	89.250	193.102	127.516	66.0%
60+%	35	170.543	230.103	95.605	41.5%
Total	**81**	**118.691**	**210.986**	**112.363**	53.3%

Table 7. Debt income ratios of farmers according to village income level and share of dairy farming income

Village Income Level	Share of Dairy Farming Income		
	0-30%	**30-60%**	**60+%**
Low	37.1%	71.4%	56.3%
Mid	107.4%	63.7%	54.5%
High	33.7%	57.5%	4.1%
Total	55.9%	66.0%	41.5%

When the change in the average debt amounts per farm in terms of US dollars of them is analyzed, it is seen that the debt amounts of farms with low income levels have increased significantly. On the other hand, it was determined that there was less debt increase in farms with high income levels (Table 8).

Table 8. The change in the average debt amounts of the mixed production farms according to the village income level between the years 2015-2018 (US dollars)

Village Income Level	2015	2016	2017	2018	Change
Low	9.580	15.343	28.862	24.619	157%
Mid	19.177	24.924	32.039	23.528	23%
High	11.259	9.611	23.120	18.941	68%
Total	**12.142**	**16.529**	**28.544**	**23.312**	92%

The number of banks that businesses work with has nearly doubled between 2015 and 2018. It is understood that farms with higher livestock income have started to work with more banks. Also, it can be said that both the debts of the enterprises and the number of banks they borrow from have increased (Table 9).

Table 9. Change in the number of banks where mixed production dairy farms work

Share of Dairy Farming Income	2015	2018
0-30%	3.9	5.4
30-60%	3.1	6.8
60+%	3.5	5.6
Total	**3.4**	**6.1**

From the above data, it is understood that the demand for loans from such farms is continuous. Another reason for the continuation of borrowing is the decrease in the economic profitability ratios of the enterprises and the decrease in their debt payment capacity. In a study conducted in this area, it has been revealed that the economic profitability ratio is the most important factor in loan debt payments (Ünlüer and Güneş, 2013). On the other hand, it is seen that the most important factor during loan utilization is the interest rate. The second most important element is fees and commissions, and a relatively less important element is the required collateral. At this point, it seems certain that it is not a factor that they consider unimportant for businesses that use loans, and contrary to popular belief, they are much more sensitive to interest and commission rates (Table 10).

Table 10. The preferences of the farmers for the 3 factors in the use of credit

	1	2	3	4	5	6	7	8	9	10	Mean
Interest Rate	0	0	1	0	1	2	3	19	66	34	8.95
%	0.0	0.0	0.8	0.0	0.8	1.6	2.4	15.1	52.4	27.0	
Fees / Commisions	0	1	1	2	1	5	32	55	27	2	7.73
%	0.0	0.8	0.8	1.6	0.8	4.0	25.4	43.7	21.4	1.6	
Collateral	2	0	1	0	1	12	43	42	21	4	7.52
%	0.2		0.3		0.5	7.6	31.8	35.4	19.9	4.2	

It is necessary to consider the preferences of the farms on some issues to present proposals for financing the enterprises. The mixed businesses surveyed are partially willing to try a new product. While it is stated that businesses can allow their own business to be used to try a new product (7.04/10), the ratio of businesses that can be willing to use higher-interest loans than normal for higher efficiency production is low (4.51/10). On the other hand, it is striking that businesses need a cooperative that can market their products (8.65/10), but they find the management of these cooperatives to have low level of knowledge (7.52/10) (Table 11). Yercan and Kınıklı (2018), found the study cooperative management should be young and educated. When other studies in the literature have been alsı examined, similar results have been found (Kınıklı and Yercan, 2017; Kınıklı et. al. 2017a; Kınıklı et. al. 2017b; Kaya et. al. 2019; Değer et. al. 2020).

Table 11. Some preferences of farmers regarding financing and marketing

	1	2	3	4	5	6	7	8	9	10	Average
I can use my field or animals to try a new product in my area.	1	10	18	4	110	144	203	136	189	10	**7.04**
%	0.1	1.2	2.2	0.5	13.3	17.5	24.6	16.5	22.9	1.2	
I can use a higher-than-normal interest loan for higher efficiency production	44	38	42	68	95	24	35	24	9	10	**4.51**
%	11.3	9.8	10.8	17.5	24.4	6.2	9.0	6.2	2.3	2.6	
I need a cooperative to market my product	3	8	3	4	25	18	56	304	279	330	**8.65**
%	0.3	0.8	0.3	0.4	2.4	1.7	5.4	29.5	27.1	32.0	
Insufficient knowledge level of cooperative or union management	0	8	12	4	15	60	385	192	207	20	**7.52**
%	0.0	0.9	1.3	0.4	1.7	6.6	42.6	21.3	22.9	2.2	

4.CONCLUSION

It is seen that dairy farming is a preferred type of agricultural production in farms with relatively low land size, and the they engaged in this activity are mostly farm crop production farms. However, there are doubts as to the extent to which this activity supports revenue growth. Because the debt/income ratios of farms with small land assets or low income levels are high, and it is seen that the amount of borrowing has increased compared to previous years. Based on the findings of the research and the determinations made, suggestions regarding the design and utilization of financial resources can be listed as follows:

1) It is necessary to offer credit products with monthly or quarterly installments instead of agricultural loans with annual payment to farms that carry out dairy farming activities. Because plant production and dairy farming are production activities with completely different cash cycles.

2) Financial literacy trainings should be given to the farmers dealing with mixed production to understand the basic differences of dairy farming and plant production activities and to understand their financial needs in the best way.

3) Businesses need a cooperative organization to market products. For this reason, cooperatives need to be strengthened in the fields of milk purchase, storage, and transportation. To do this, it is important that the cooperatives in question have a record keeping system and accordingly they should be turned into economic farms that keep a regular accounting record. Financial resources should be provided for the milk purchasing cooperatives to receive feed or similar inputs to their members in cash. In the design of this resource, the cooperative and its members should be considered as a whole, and the volume and period of the commercial relationship between the cooperative and the members should be considered in the calculation of credit limits.

5) Businesses need a marketing cooperative to sell their products, but they do not trust the cooperatives. Businesses think that the level of knowledge of the management staff of cooperatives is insufficient. To break this perception, face-to-face or electronic sharing platforms should be implemented where successful cooperative managers can transfer their experiences to other cooperatives and businesses.

Contribution Rate of Researchers Declaration Summary
The authors declare that they have contributed equally to the article and have not plagiarized.

Conflict of Interest Declaration
The authors of the article declare that there is no conflict of interest between them.

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