

## ASSESSING THE IMPACT OF DAIRY POLICIES ON THE SOCIO-ECONOMIC AND TECHNOLOGICAL CHARACTERIZATION OF TURKISH DAIRY INDUSTRY

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### Abstract

*The aim of this study was to comparatively analyze the impact of dairy farming policies on the socio-economic and technological characterization of dairy industry. Primary data were collected from dairy farms through the use of structured questionnaires and were analyzed using both descriptive and inferential statistics. Data obtained was analyzed using Chi-square ( $\chi^2$ ) test. In this study, modern and traditional dairy farms were compared in terms of their socio-economic and technological characterization and structural farming practices, and adoption levels of dairy farming support services. The results revealed that there is a statistically significant difference between the improved and traditional dairy farms in terms of education level of farm holder, gender of farm holder, agricultural credit use, purpose of dairy farming, farm land size, number of cattle, number of milking cow, barn type, size of barn, feeding system silage making status of farm, fodder crop growing, milk marketing channels, farmers' reasons for choice in milk marketing channel, type of dairy farming supports received by farmers, use purpose of dairy farming supports by farmers, effects on modernization of dairy farms and increase in farm income of dairy farming supports variables. The result depicted that improved dairy farms benefit more from dairy farming and rural development supports than the traditional dairy farms. As dairying is the sole source of income in the area, the study concludes by highlighting the importance of government support for small and medium sized dairy farms in the study area. The conclusion is that policy makers should take into account socio-economic and technological characterization of dairy farms in implementation of dairy farming policies to ensure sustainable food security, food safety and farmers' income.*

**Key words:** dairy industry, policy assessment, technological characterization, comparative analysis.

### INTRODUCTION

Dairy farming has great importance for agriculture sector, economy and employment in Turkey. One of the most significant changes in Turkish agricultural economy over the past ten years has been the rising contribution of dairy farming sector in the agricultural gross domestic product. The contribution of dairy production is 26.5% in the agricultural production value, and the greatest contribution to dairy production value comes from cow milk as much as 42.0% of it. Contribution of milk production in agricultural production is 11.2%. It is said that the required workforce is provided by family labor for approximately 1.6 million dairy farms in Turkey. The number of employees in dairy sector in Turkey is 477 146.

Annually, 16.87 million metric tons of milk is produced out of which 91.18% is obtained from cattle (TURKSTAT, 2015). Thanks to government subsidies and incentives, there have been important developments in dairy farming in Turkey. Significant increases in the number of dairy cows and quantity of milk production have occurred. The total number of cattle was around 11.18 million in 2000 and increased to 14.12 million in 2014, equivalent to 26.30% increment. Total annual cow milk production was around 8.98 million tons in 2000 and increase to 16.86 million tons in 2014, (87.75% increases) (TURKSTAT, 2015). Dairy farming is the main source of income and employment among the low-income population living in rural areas in Turkey. Many studies indicate that dairy farming is important on both

economic and social basis (Demircan et al., 2006; Artukoglu and Olgun, 2008; Demir and Aral, 2009; Demir and Yavuz, 2010; Ozcatalbas et al., 2010). Dairy farming sector in Turkey should be the locomotive of the rural economic development as in the whole world. To be successful on rural economic development, it is necessary to improve dairy farming in order to develop the rural community and improve their life standards.

Turkish dairy farming sector is characterized by a dual structure: traditional and modern. Regional differences in dairy farming technology use are also a distinct characteristic of the dairy farms. There are some structural problems in dairy farms of Turkey such as unorganized small dairy farms, lack of forage production in high quality, unstable prices of input/output, high costs, dual structure, low milk production and yield, ineffective support and policies and absence of market mechanism. Several small dairy farms are weak against the powerful dairy industry. A successful cooperation of those small farms could not be achieved yet. Some problems still wait for the solution, especially, in terms of milk yield and quality (Yilmaz and Koknaroglu, 2007). Although reform projects and dairy farming supports were executed in the last ten years, desired level of milk yield and quality has not been achieved yet. In comparison to average milk yield per lactation of 6.55 tons in European Countries (EU-28), (EUROSTAT, 2015), the equivalent amount of 2.97 tons in Turkey is quite low.

In the last ten years, dairy support policies have been implemented in different periods and different subsidies to develop dairy sector in Turkey. There have been radical changes in dairy farming support policies starting from 2005 year. During the period of 2005 to 2014, the support policy gave more emphasis to animal with breeding pedigree, calves born by artificial insemination, artificial insemination subsidy, milk premium, milking hygiene and milk quality, disease free farm, fighting animal diseases, heifer supports and forage crops (Anonymous, 2014).

Dairy farming policies plays an important role in dairy production and assure better income and welfare levels for smallholder dairy farmers. In order to achieve a regular income

and a more market-oriented production pattern in dairy farming sector, it is necessary to analysis the effects of dairy farming support policies in rural areas. In recent years, many studies have been made on dairy farming. Nevertheless, no study has comparatively examined the effect of dairy farming policies on the socio-economic and technological characteristics of improved and traditional dairy farms in Turkey. The output of this study can also serve as an input for a large scale study on the evaluation of dairy policy in the country in terms of its capacity to generate quality products that meet the EU standard. The study was undertaken in Burdur Province since its economy largely depends on dairy and also contributes a lot to the national dairy production in the country.

## **MATERIALS AND METHODS**

Burdur is one of the leading provinces of Turkey in dairy farming production. Burdur has a large dairy cattle population approximately 198346, being raised on approximately 17 679 dairy farms in 2014. The total number of cattle was around 105 128 in 2000 and increased 198 346 in 2014, increase 88.67 of %. Total annual cow milk production was around 129 333 tons in 2000 and increased 332 980 tons in 2014, increase of 157.46% (TURKSTAT, 2015). The number of cattle owned in Burdur province is 1.39% of the total number of cattle in Turkey. The Holstein cattle population in Burdur represents a significant portion of the total Holstein cattle population in Turkey (Agaoglu et al., 2015).

This study was conducted for a period of six months starting from March to August 2013. The primary data were collected from a formal survey of sample dairy farm households. The sampled population took into account the improved (which fixed milking unit and the cooling tank) and traditional dairy farms. Intentional sampling method was used to determine the districts and the number of samples for each district based on dairy farming activities (Karasar, 1991). Dairy farm populations were obtained from "Burdur Directorate of Provincial Food Agriculture and Dairy". Based on the population size, 100 dairy farmers were determined of 50 improved and

50 traditional dairy farms from 19 villages in Central, Yesilova Cavdir, Karamanli, Celtikci, Tefenni and Bucak districts of Burdur Province, Turkey.

In this study, two analyses were made: descriptive analyses (by use of means, standard deviations, percentages, and frequencies) and the inferential analyses (by use of chi-square test). Descriptive statistics were worked out to understand and explain the dairy farming practices by farmers, logistics and managerial behavior of dairy farmers, technological and structural characteristics of improved and traditional smallholder dairy farms. Chi Square test ( $\chi^2$ ) measures whether there is a significant difference between the effects of two categorical independent variables on a categorical dependent variable (Howell, 2009; Koseoglu and Yamak, 2008). The Chi square test (Eq. 1) was used to determine whether there is a significant difference between the improved and traditional dairy farms as a result of dairy support program. In the statistical analysis, the SPSS 22.0 (Statistical Package for Social Sciences for Windows 22.0) program has been used and the test results have been verified at a significance level of 1% and 5%.

$$\chi^2 = \sum_{ij} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \quad (\text{Eq. 1})$$

where:

$\chi^2$  = calculated chi-square value

$O_{ij}$  = observed frequency value

$E_{ij}$  = expected frequency value

Dairy cattle population on the farm was converted to Livestock Units (LU) by means of coefficients (Erkus et al., 1995). Active labor on the farms was expressed as full-time equivalent (Karwat-Wozniak, 2014).

## RESULTS AND DISCUSSIONS

The general characteristics of the improved dairy farms were compared with the traditional dairy farms in order to understand nature of the sample. A wide range of socio-economic, technological and structural characteristics were provided in the survey. Some basic characteristics of the sampled farms are presented in Table 1. Farmer's average year is 41.88 years old for the improved dairy farms and that of traditional dairy farms is 42.78

years. Experience in dairy farming was approximately same in both farms. The educational level of farmers in the improved dairy farms was higher compared to traditional dairy farms. Proportion of farm that hired foreign workers in the improved dairy farms was 14%, higher than the traditional dairy farms (4%). Proportion of farmers who used agricultural credit in the improved dairy farms was 78%, higher than the traditional dairy farms (36%). The amount of milk production, farm size, forage crop production area, household income and total feed consumption in the improved dairy farms are higher compared to traditional dairy farms. Average farm size for the improved and traditional dairy farms was 19.87 and 8.42 ha<sup>-1</sup>, respectively. The study showed that mixed farming system was main dairy production system and different cereal and forage crops were predominantly produced. Average forage crop and grain production area for the improved and traditional dairy farms was 18.59 and 8.07 ha<sup>-1</sup>, respectively. It was determined that the rate of forage crop and grain production area in average farm size for the improved and traditional dairy farms was 93.58% and 95.89%, respectively. Examining the feed consumption, results indicated that the total feed consumption (roughage and concentrate feed) average was found to be 33.68 and 24.49 kg/LU per day for the improved and traditional dairy farms. Average number of cattle for the improved and traditional dairy farms was 90.78 and 36.50 farm<sup>-1</sup> respectively. There is no domestic races and culture crossbred in the investigated improved and traditional dairy farms. All of them are Holstein races. Average milk production per farm for the improved and traditional dairy farms was 253.66 and 89.77 tons per year, respectively. Average milk yield per cow for the improved and traditional dairy farms was 19.80 and 18.56 kg per day, respectively. Average income of household for the improved and traditional dairy farms were 290 200 farm<sup>-1</sup> and 104 560 TRY farm<sup>-1</sup>, respectively (Table 1). Dairy farming is generally integrated with cropping activities in the smallholder farming system via using crop by-products as cattle feed and applying manure to crops. Dairy farming and crop production serves the overall objective of providing food

and cash income for the farm family in the surveyed improved and traditional dairy farms. The following can be concluded from the chi-square ( $\chi^2$ ) showing relationships between improved and traditional dairy farms and their selected socio-economic characteristics. The result of the analyses shows that education level of farmer ( $p<0.05$ ), and gender of farmer ( $p<0.05$ ), agricultural credit use ( $p<0.01$ ), and purpose of dairy farming ( $p<0.05$ ), showed significant difference between the improved and traditional dairy farms. However, no significant differences were observed on age, dairy farming experience, household size, non-agricultural income, number of employees on the dairy farming and hired foreign workers. According to the result of  $\chi^2$  test applied to find out whether there are any differences in the technological, structural and dairy farming characteristics, there is a significant difference on farm land size ( $p<0.01$ ), number of cattle ( $p<0.01$ ), number of milking cow ( $p<0.01$ ), barn type ( $p<0.01$ ), size of barn ( $p<0.01$ ), feeding system ( $p<0.01$ ), silage making status of farm ( $p<0.01$ ), fodder crop growing ( $p<0.05$ ), milk marketing channels ( $p<0.01$ ), and farmers' reasons for choice in milk

marketing channel ( $p<0.01$ ) between the improved and traditional dairy farms (Table 2). In the surveyed dairy farms, two types of feeding systems are practiced. In one system, the cows are feed free stall. In the other system, the cows are feed as a tie stall. It was determined that the rate of free-stall feeding system in improved dairy farms are higher than the rates in the traditional dairy farms ( $p<0.001$ ). The number of cattle kept by the farmer determines the total production costs and therefore influencing the amount of working capital needed on the dairy farm. This motivates farmers with a large herd size to prefer supplying milk to channels that handle big volumes and pay milk revenues in lump sum (Anjani et al., 2011; Nkwasiwe, 2014). Dairy cooperatives play an important role in dairy production and milk marketing in the research area. Milk like any other agricultural products also reaches the consumer through different marketing channels. It is sold through dairy cooperatives, milk processing factories, and national or regional dairies (Artukoglu and Olgun, 2008). Some studies reported that herd size significantly affect farmers marketing channel choice.

Table 1. General characteristics of surveyed dairy farms

Indicators	Improved Dairy Farms		Traditional Dairy Farms	
	Mean	Standard Deviation	Mean	Standard Deviation
Age of farm holder	41.88	10.80	42.78	9.49
Dairy farming experience of farmers (year)	15.84	7.67	15.02	5.79
Household population (person)	4.28	1.64	4.00	1.01
Labor use (FTE) <sup>a</sup>	2.66	1.06	2.32	0.79
Proportion of farm that hired foreign workers (%)	14.00	-	4.00	-
Education level of farm holder (year)	8.44	2.99	6.88	2.55
Agricultural Cooperative membership (%)	100.00	-	100.00	-
Proportion of farmers who used agricultural credit (%)	78.00	-	36.00	-
Number of Cattle	90.78	52.28	36.50	14.48
Dairy Units (LU)	62.66	34.18	25.41	10.95
Cow	40.28	19.71	16.82	9.39
Heifer	18.20	12.61	7.56	4.03
Yearling	13.56	10.79	4.51	2.83
Calf	16.90	13.10	7.20	4.94
Yearling Bull	1.52	4.49	0.46	1.16
Bull	0.32	1.52	0.04	0.20
Milk Production (ton/farm)	253.66	147.69	89.77	50.40
Milk Yield (kg/head)	19.80	1.85	18.56	1.86
Average Lactation Length (month/year)	9.72	0.64	9.68	0.55
Farm Size (hectare)	19.87	12.89	8.42	6.21
Arable land (including second crop)	20.77	12.59	8.58	6.26
Irrigated land	15.87	12.09	3.65	3.23
Non-irrigated land	4.04	4.95	4.76	5.75
Owned land	10.89	9.49	4.83	3.48
Rented land	8.98	9.17	4.76	5.75
Fallowing land	0.38	1.61	0.06	0.36
Roughage feed consumption kg/LU/day)	24.29	9.02	16.45	9.70
Concentrate feed consumption kg /LU/day)	9.38	2.96	8.04	2.38
Total feed consumption kg/LU/day)	33.68	10.45	24.49	9.98
Roughage feed supplied on-farm (%)	54.48	-	48.65	-
Concentrate feed supplied on-farm (%)	14.85	-	18.50	-
Average household income (TRY /year)*	290 200.00	153083.81	104 560.00	53 133.32
Proportion of farmers has non-agricultural income (%)	32.00	-	42.00	-
Proportion of dairy farming in household income (%)	77.14	-	73.81	-

Source: author's calculations based on farmer survey data. \*1 US Dollar (USD) = 1.91 Turkish Lira (TRY); <sup>a</sup>(FTE): full-time equivalent

Herd size of dairy cattle determines the volumes of milk available for sale and influences farmers' choice of marketing channel. Large milk producers get price incentives because of high bargaining power as well as lower transaction costs (Falkowski et al., 2008; Gong et al., 2009).

Smallholder farms, which are mostly family farms, have in general the lowest average farm income per labor unit. In the absence of dairy farming supports, the gap between large and smallholder farms would increase, in particular for farms specialized in field crops and for mixed farms. The smaller the farm, the greater

is the effect of dairy farming subsidies on income stability. In the absence of dairy farming subsidies, the incomes of small farms would be particularly volatile. It should be noted that, even with dairy farming supports, the incomes of smallholder farms are already more volatile than the incomes of medium-sized and large farms (EU, 2011). Table 3 shows that the chi-square test result of differences between improved and traditional dairy farms in terms of dairy farming supports received and its impact on income and modernization of the dairy practices.

Table 2. Dairy farming practices with the technological and structural characteristics

Variables	Improved Dairy Farms		Traditional Dairy Farms		Calculated $\chi^2$ Value	P
	N	%	N	%		
<b>Farm land size (decare)</b>						
< 50	2	4.08	10	20.41	25.609	0.000***
50-150	19	38.78	34	69.39		
150+	28	57.14	5	10.20		
<b>Number of parcel</b>						
1-5	8	16.33	9	18.37	4.775	0.092
6-10	10	20.41	19	38.78		
11-+	31	63.27	21	42.86		
<b>Number of cattle</b>						
10-30	1	2.00	18	36.00	52.776	0.000***
31-50	6	12.00	25	50.00		
51+	43	86.00	7	14.00		
<b>Number of milking cow</b>						
10-20	3	6.00	43	86.00	64.449	0.000***
21-50	42	84.00	6	12.00		
51+	5	10.00	1	2.00		
<b>Barn type</b>						
Semi-open	33	66.00	9	18.00	23.645	0.000***
Closed	17	34.00	41	82.00		
<b>Size of barn (m2)</b>						
120-500	7	14.00	30	60.00	30.135	0.000***
501-1000	8	16.00	11	22.00		
1001+	35	70.00	9	18.00		
<b>Feeding system</b>						
Free stall	23	46.00	9	18.00	9.007	0.003***
Tie stall	27	54.00	41	82.00		
<b>Silage making status of farm</b>						
Yes	46	92.00	25	50.00	21.418	0.000***
No	4	8.00	25	50.00		
<b>Forage crop growing</b>						
Yes	49	98.00	44	88.00	3.840	0.050**
No	1	2.00	6	12.00		
<b>Milk marketing channels</b>						
Cooperative	16	32.00	46	92.00	38.200	0.000***
Dairy Products Factory	34	68.00	4	8.00		
<b>Farmers' reasons for choice in milk marketing channel</b>						
High price	24	48.00	20	40.00	24.289	0.000***
Ready payment	7	14.00	21	42.00		
Milk sales from the farm (No transport costs)	21	42.00	2	4.00		
Constant milk purchases	38	76.00	42	84.00		
Advance payment	3	6.00	6	12.00		
Reliable market /No defaulting farmers' money	40	80.00	37	74.00		

Source: author's calculations based on farmer survey data. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ .

The result of the analysis is shown in Table 3, there is a significant relationship between the improved and traditional dairy farms, considering the farmers receiving and not

receiving dairy farming supports ( $p < 0.01$ ). It was also determined that there is a significant relationship between the improved and traditional dairy farms, considering the farmers'

using for agricultural and non-agricultural purposes of dairy farming support they receive from the government ( $p<0.01$ ). It was also found that the rate of use of dairy farm supports

for agricultural purpose by improved dairy farms was 54% while it was found to be 76% for the traditional dairy farms.

Table 3. Dairy farming supports received by farmers and their effects

Variables	Improved Dairy Farms		Traditional Dairy Farms		Calculated $\chi^2$ Value	<i>p</i>
	N	%	N	%		
<b><i>Dairy farming supports received by farmers</i></b>						
Feed crop production premium support	39	78.00	23	46.00	108.763	0.000***
Brucella S-19 vaccine support	50	100.00	50	100.00		
Calves support born by artificial insemination	50	100.00	50	100.00		
Milk incentive premium	50	100.00	50	100.00		
Parent cattle support	50	100.00	50	100.00		
cooled milk premium	50	100.00	0	0.00		
milk quality premium	50	100.00	0	0.00		
Rural development grant support	44	88.00	2	4.00		
<b><i>Use purpose of dairy farming supports</i></b>						
Agricultural	27	54.00	12	24.00	9.458	0.002***
Agricultural +non agricultural	23	46.00	38	76.00		
<b><i>Effects on modernization of dairy farms of dairy supports</i></b>						
Technological development was provided	44	88.00	26	52.00	15.429	0.000***
Technological development wasn't provided	6	12.00	24	48.00		
<b><i>Effects of dairy farming supports on incomes increase</i></b>						
Increased	38	76.00	29	58.00	3.664	0.056
No changed	12	24.00	21	42.00		

Source: author's calculations based on farmer survey data. \*\*\*  $p<0.01$

This study also determined the beliefs and opinions of farmers on the effects of the dairy supports on modernization of dairy farms. According to the result, 88 and 52% of farmers from the improved and traditional dairy farms respectively reported that the support program provided technological development (modernization) to the dairy farms. This difference was found to be statistically significant ( $P<0.01$ ). Furthermore, 76% of improved and 58% of the traditional dairy farms recognized the positive economic effect of the support program. The larger economic benefit of the improved dairy farms can be attributed to the fact that traditional dairy farms couldn't receive the cooled milk and milk quality premium as they do not have the fixed milking unit and the cooling tank. Besides, the rate of utilization of rural development grant support is very low in the traditional dairy farms.

Although Turkey has a great potential for dairy farming, it has not reached the desired level yet. One of the most important reasons for this occasion to arise is the uncertainty and inefficiency in dairy policy pursued (Yilmaz, 2006). The main problem of dairy industry in Turkey is supply shortage, milk yield and quality of raw milk. Small and low efficiency farms can be the reason for this problem. The low number of cattle per farm is a result of the

poor quality of the farmland and the low intensity of land cultivation. Considerable differences exist between the different regions and availability of irrigation has a marked influence on cattle keeping (Budak, 2009). Moreover, there are many problems pending to be solved such as not being able to provide suitable barn, inadequacy of herd size and farm land, lack of forage and fodder crops production, ineffective extension service, inadequacy of grassland management policies, scantiness of meadow-rangeland areas (low pasture quality), absence of effective farmer organization, turning the rise of product input prices against product prices, not adopting the pedigree system and economic principles in farms (Ozcatalbas et al., 2009). Table 4 shows that problems perceived and encountered by farmers in surveyed dairy farms. The research results showed that the majority of these farmers faced problems and constraints including; lack of forage crop production, inadequate and unsuitable of barn, lack of labor, financial difficulties, high of roughage and concentrate feed price (high cost), lack of cultivated area, low milk prices, low production per cow and one milking per day. Among the problems the most commonly encountered in dairy farming in the study area are lack of forage crop production, high of roughage and concentrate feed price and high feed costs.

Problems on the shortage of labor and cultivated area were found to be more pronounced in the improved dairy farms than in the traditional dairy farms. The problems are equally important in both the improved and traditional farms as there was no statistical difference on the rating of problems between the two types of farming. A critical factor for increasing the milk production is the limited availability of arable land because of the small size in surveyed dairy farms. Policy initiatives could be taken to train farmers, with the aim of enhancing their profitability by improving general dairy farming practices and on-farm rough forage crop production. Despite all the

problems it faces, the dairy sector holds high promises as a dependable source of livelihood for the vast majority of the rural poor in Turkey. Sustainable dairy farming is an interaction of many factors that influence production and reproduction environment, longevity of live and input management. It is therefore necessary to plan for dairy development specific to each micro level, a barn, a village, and a district for sustainable dairy farming. This planning not only would result in optimum utilization of local resources, but will also ensure better viability of the programs and higher cost benefits ratio (Shahi et al., 2012).

Table 4. Challenges perceived and encountered by farmers in surveyed dairy farms

Challenges	Improved Dairy Farms		Traditional Dairy Farms		Calculated $\chi^2$ Value	p
	N	%	N	%		
Lack of forage crop production	12	24.00	13	26.00	4.177	0.524
Inadequate and unsuitable of barn	6	12.00	7	14.00		
Lack of labor	8	16.00	2	4.00		
Financial difficulties	7	14.00	9	18.00		
High of roughage and concentrate feed price/ high costs	11	22.00	13	26.00		
Lack of cultivated area	10	20.00	9	18.00		

Source: author's calculations based on farmer survey data.\*Multiple responses

## CONCLUSIONS

The purpose of this study was to comparatively analyze the impact of dairy farming policies for improved and traditional smallholder dairy farms in terms of the socio-economic, structural and technological characterization of dairy industry.

The result of the analyses showed that there is a statistically significant difference between the improved and traditional dairy farms, considering education level of farm holder, gender of farm holder, agricultural credit use, purpose of dairy farming, farm land size, number of cattle, number of milking cow, barn type, size of barn, feeding system silage making status of farm, fodder crop growing, milk marketing channels, farmers' reasons for choice in milk marketing channel, type of dairy farming supports received by farmers, use purpose of dairy farming supports by farmers, effects of dairy farming supports on modernization of dairy farms and effects of dairy farming supports on dairy farm incomes increase variables.

The dairy farming sector is socially, economically and politically very significant; it

provides food and income for one small dairy farmer, especially in research area, where dairy farming is often the only source of livelihoods. Therefore, much attention should continue to be given for the sector by policy makers. In light of the results obtained from this study, the following recommendations could be developed and implemented.

First, instead of dealing with the trivial details of dairy farming policy, policy-makers should first determine what subsidies are intended to accomplish. Dairy farming subsidies should be promoted as assistance to family dairy farms. While transforming traditional dairy farms to the improved dairy farms, the government should provide monetary support so that farmers should change their growing area to forage and fodder crops.

Second policies need to create conditions, which sustain high farm productivity and production efficiency at lower operating costs to allow the dairy sector to become competitive. As starting points, policymakers should look at issues such as land ownership and subsidies with an emphasis on farm inputs

such as machinery, veterinary medicine, concentrate and forage feedstuffs, which can improve farm productivity through intensification.

The government is carrying out a support policy, such as milk quality premium, cooled milk premium, parent cattle support, and milk incentive premium, calves support born by artificial insemination and forage crop production support in dairy farming. Government should continue to support the small and medium-sized dairy farms. It was said that Turkish dairy farming is lagging behind, based on criteria such as lactation milk yield, farm size, milk processors, milk consumption per capita and share of dairy cattle production in agricultural production value. Turkish dairy farming production branch cannot compete with European Union (EU) in terms of production, milk quality, technology use, productivity and farms size. Dairy farming sector is still the most critical sector in Turkey. In the harmonization process to EU standards, support policies toward enhancement of competitive power of dairy farming sector in Turkey should be a priority. The government should continue to provide monetary support to farmers to enable them to meet the EU standards.

It is said that, dairy farmer need reliable markets to sell their milk each season and an adequate price to compensate them for their efforts and provide incentive to continue production the following year in research area. Turkish governments and policy makers can help by: establishing and maintaining good dairy farming policies that include revenue assurance programs, such as guaranteed prices that may require supplemental payments in difficult years, working with the private sector to support producer associations or price pooling cooperatives, which give farmers improved access to markets and greater leverage in pricing their products, providing revenue safety nets themselves and encouraging the private sector to provide price assurances through their contracts with farmers.

It was felt that the government should provide adviser to help farmers, and should also facilitate a business management-mentoring program that would enable farmers to help farmers. To support innovation and enable

producers to capture opportunities, we suggest the dairy farming cooperatives to host forums between researchers and farmers to enable knowledge transfer. Furthermore, future researches are needed to analyze broader aspects of impact of the dairy farming policies on the characteristics of dairy farming.

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