Are the Marketing Margins of Poor Livestock Farms in Rural Areas Adequate for the Sustainability of Livestock Farming? An Example from Rural Turkey

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Abstract: Livestock has an important role in reducing rural poverty in that it provides people living in rural areas with income and employment opportunities and at the same time contributes to an improvement in the distribution of income. However, in many developed countries the structural and economic problems associated with livestock constitute a significant threat to it. It was found that this threat comes more from economic problems and is related to poor marketing efficiency by farmers. This study examines rural livestock farms in the Aegean Region of Turkey, with emphasis on distribution channels in marketing by animal breeding farms, prices in those distribution channels and on showing the trading margins, which arise in these channels. The results obtained in the study show that animal breeding farms in the rural areas of Turkey do not have an efficient marketing system, when marketing margins, which they obtain are considered. For milk, the most important product, the total intermediary's margin was calculated in the study as 64.96% and the relative margin as 185.36%. The study also makes some suggestions on increasing marketing efficiency for animal breeding farms in rural areas.

Key words: Livestock, animal products, animal breeding farms, profit margin, marketing channels, Turkey

INTRODUCTION

Livestock is an essential part of rural social, economic and environmental systems and at the same time is the largest and fastest-growing sector of the agricultural economies of many developed countries or countries in transition. In some countries, livestock constitutes more than 80% of agricultural GDP. For many people living in the poor rural areas of the world, animal breeding provides food, income, savings and social status and is also a kind of insurance. The lives of about 70% of the 880 million people in rural areas who have incomes of less than $1 a day depend at least partly on livestock. For >200 million smallholder farmers in Asia, Africa and Latin America, livestock such as cattle, buffalo, sheep, goats and poultry is the main source of income (FAO, 2007a).

World demand for animal products especially meat and milk products is rapidly increasing, with the trend varying from one area or country to another. Globally, agricultural GDP is decreasing as a share of total GDP as the economy expands but the share of livestock GDP within that of agriculture in general is rising.

But at the same time, the livestock sector in sub-Saharan Africa, Latin America and Asia, which is the most important agricultural sector for economic growth and the reduction of poverty, is growing more slowly and the demand for products per person is more or less static.

In these countries, factors such as insecure land tenure, ineffective animal health services and limited access to credit and inputs prevent smallholders and pastoralists from making profitable use of their livestock. For example, the limiting factors for the efficient marketing of animals were shown to be poor marketing infrastructure, insufficient herd sizes, high marketing costs and low purchasing power of buyers (Musemwa et al., 2007). Most of these problems, whether identified in South Africa or in Asia or Latin America, can be encountered in Turkey, which is the transition point between Europe and Asia.

In fact, Turkey is a country, where the agriculture sector's share in the GDP has declined but is still relatively important (7.8% in 2008), where important infrastructure problems can be found such as a lack of attention to animal health, small size and scattered distribution of livestock farms, insufficient use of modern technology, limited use of high-yield breeds and a shortage of veterinary personnel, in addition to the inadequacy of marketing organization. In addition, rising costs such as for animal feed are a significant burden on animal breeding. The reason for this increased burden is

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that along with high increases in production costs, producers are forced to sell at a low price because their marketing efficiency is weak. The result of these problems is that there has been a decline in interest in animal production in Turkey. This is shown by the decrease in the number of animals in Turkey generally. Thus, the number of milking cattle fell to 4,111,683 in 2008, a 34.63% decrease on 1991. Over the same period, numbers of cattle fell by 33.32%, buffaloes by 81.62%, sheep by 58.48% and goats by 66.01% (Table 1).

This great relative decline in the number of animals generally had an adverse effect on the production of animal products. For example, the production of red meat in 2008 was 482.458 tonnes, a 39.37% decrease on 1991. One result of this decreasing production is the current high price of meat in Turkey.

In order to increase and continue animal production in Turkey, various measures may need to be taken. There are limiting factors such as time and financing that mean that merely improving operational infrastructure may be inadequate. At this stage, ways of improving the efficiency of marketing by livestock breeding farms are important. This becomes more apparent, when it is realized that the marketing ratio of milk produced in Turkey is about 61%. In this regard, it is important to determine the distribution channels that are used to market the products of livestock farms in rural areas in Turkey and the intermediaries and producers margins in these channels. In this way, it will be possible to suggest a number of measures to be taken in the marketing of animal products, where the intermediary's margin is high. This study examines animal breeding farms in the rural areas of

Table 1: Number of animals milked by types and races and quantity of milk production in Turkey

	Sheep-domestic		Sheep-merinos		Goat-ordinary		Goat-angora	
Years	No. of animals milked (head)	Milk (tons)	No. of animals milked (head)	Milk (tons)	No. of animals milked (head)	Milk (tons)	No. of animals milked	Milk (tons)
1991	22,731,840	1,110,534	490,405	16,909	5,275,399	322,084	602,091	12,655
1992	21,909,840	1,072,445	489,423	16,728	5,082,446	308,356	519,690	10,993
1993	21,044,902	1,030,609	486,947	16,771	4,991,455	304,149	472,414	9,878
1994	20,018,292	975,381	489,177	16,420	4,769,131	288,567	393,404	8,160
1995	18,801,878	918,495	460,615	16,005	4,544,493	269,670	363,091	7,537
1996	18,411,011	904,623	479,072	17,039	4,379,230	258,159	346,645	7,295
1997	16,685,799	809,553	482,907	16,795	4,111,256	243,044	295,930	6,258
1998	16,278,560	795,773	497,676	17,305	3,988,811	240,121	258,378	5,458
1999	16,015,358	789,084	457,982	15,612	3,843,219	231,420	243,044	5,161
2000	15,489,474	759,875	430,685	14,504	3,604,719	216,328	187,988	3,883
2001	14,427,279	709,503	419,474	13,843	3,590,165	215,881	183,301	3,914
2002	13,265,493	645,465	371,701	11,922	3,412,094	206,403	141,344	3,218
2003	12,115,951	754,979	361,266	14,980	2,999,110	274,350	127,546	3,786
2004	9,591,015	756,001	328,176	15,715	2,379,038	255,468	97,536	3,619
2005	9,837,155	774,344	328,936	15,533	2,331,556	250,246	95,437	3,513
2006	9,884,636	777,385	361,258	17,296	2,334,514	250,594	86,128	3,165
2007	9,698,433	762,930	411,554	19,657	2,190,602	234,883	73,027	2,604
2008	9,224,076	726,894	418,094	19,978	1,937,387	207,385	60,302	2,185

	Cattle-culture		Cattle-cross bred		Cattle-domestic		Buffaloes	
	No. of animals milked (head)	Milk (tons)	No. of animals milked (head)	Milk (tons)	No. of animals milked (head)	Milk (tons)	No. of animals milked (head)	Milk (tons)
1991	650,739	1,913,438	2,087,014	4,188,398	3,381,244	2,514,576	171,082	161,348
1992	698,223	2,065,445	2,124,103	4,236,269	3,247,849	2,413,164	165,087	155,660
1993	750,254	2,222,701	2,214,725	4,399,142	3,066,975	2,282,629	148,014	140,385
1994	779,690	2,309,742	2,308,308	4,584,837	2,994,180	2,234,294	150,034	143,606
1995	870,248	2,581,711	2,392,621	4,751,023	2,622,717	1,942,578	122,372	114,534
1996	920,185	2,723,911	2,457,923	4,827,957	2,590,102	1,913,758	113,729	108,194
1997	879,779	2,593,152	2,355,541	4,586,892	2,358,974	1,734,133	92,206	86,700
1998	879,841	2,576,065	2,346,093	4,586,511	2,263,109	1,669,483	84,893	79,815
1999	903,499	2,618,031	2,424,629	4,722,638	2,209,764	1,624,821	79,973	75,243
2000	904,849	2,639,113	2,335,119	4,591,861	2,039,601	1,501,067	69,602	67,330
2001	912,411	2,660,282	2,248,877	4,410,758	1,924,526	1,418,042	65,356	63,327
2002	850,725	2,467,889	1,971,740	3,867,656	1,570,103	1,155,088	51,626	50,925
2003	1,034,817	3,215,859	2,236,680	4,568,252	1,768,865	1,730,027	57,378	48,778
2004	832,711	3,231,461	1,699,804	4,608,293	1,343,206	1,769,571	39,362	39,279
2005	925,618	3,596,017	1,717,309	4,646,857	1,355,170	1,783,328	38,205	38,058
2006	1,106,679	4,295,367	1,799,409	4,884,590	1,281,843	1,687,345	36,353	36,358
2007	1,299,750	5,050,533	1,698,801	4,608,728	1,230,889	1,620,079	30,460	30,375
2008	1,385,730	5,380,715	1,665,189	4,520,465	1,029,324	1,353,996	31,440	31,422

TurkStat (2008b), The Results of Animal Production Statistics, Ankara. (http://www.tuik.gov.tr/VeriBilgi.do?tb_id=46&ust_id=13)

Turkey's Aegean region in pursuance of this aim. An example is given from one region of Turkey and compared with findings from various other countries and the results obtained are discussed.

MATERIALS AND METHODS

The base material of this study is constituted from primary data obtained from survey work carried out on agricultural farms in rural areas (Gumus *et al.*, 2008). Along with this, use has been made of local and foreign literature on the subject.

The survey research was carried out in the Aegean region of Turkey, which is an important region for animal production. Later, the three provinces of the region which were highest, average and lowest on the scale of socio-economic development (Izmir, Manisa and Kutahya) were chosen in order to make a general evaluation. Use was also made of the development index in the choice of sub-provinces: for each province, the three sub-provinces with the lowest index and the one with the highest, four in total, were selected. Villages were chosen in each sub-province by the judgment sampling method.

For this purpose, villages were divided into three groups: developed, medium-level and poorly-developed. From among these villages four villages were chosen: two from the low-income group and one each from the medium-income and high-income groups. In selecting the agricultural farms in these villages, where the questionnaire would be administered, these farms were grouped according to the size of their income, using the food poverty and complete poverty lines set by TUIK (the Turkish Statistics Organization) in its yearly studies. Various sources place the poverty level at 1, 2.15 or $4.30 per person per day (Philipp, 1999; TurkStat, 2008a). The average daily per capita income of the farms studied, taking into account purchasing power parity, was calculated as $1 for the first income group and $2.3 for the second. A daily income of $1 was accepted as being at the food poverty line and one of $2.3 as being at the poverty level.

The fact that animal breeding farms, whether in the Aegean region or in Turkey as a whole are on a small scale and on lines of the food poverty and complete poverty is a reason for this grouping. In particular, the fact that the viability of animal breeding farms in developed countries is to a large extent dependent on smallholder farms makes it important to examine them in detail. With this in mind, a total of 252 farms chosen by judgment sampling, 150 of them at the food poverty line and 102 at the complete poverty line were interviewed. This study included calculation of average herd size and yield of the farms examined. In addition, the marketing

channels for these farms animal products and the prices and marketing margins that came about in these channels were determined. The calculated absolute and relative marketing margins and intermediaries and producers margins enabled the evaluation of the farms marketing efficiency from various standpoints.

RESULTS AND DISCUSSION

Information on the animal products activities of the farms examined: Among the farms examined were those that kept both cattle, or sheep and goats. There were also those that kept poultry or bees. Cattle breeding was widespread and the average number of cattle per farm was 0.95 local (domestic) animals and 1.94 animals of imported breeds, making a total of 2.89 (Table 2). This number is lower than the Turkish average of 3.90 (Pesmen and Yardimci, 2008). The farms with the lowest number of cattle per farm, 1.69, were those at the food poverty line, while the number for the farms at the poverty limit was 4.67. In a similar study carried out in Lebanon, the numbers were 0 for a family at the food poverty line and 3 for one at the poverty limit (FAO, 2007b). In another study in Vietnam, where farms were categorized by size, the average number of cattle for small farms was found to be 1.4 and 4.8 for medium-sized farms (Huyen *et al.*, 2009). In the farms examined, sheep and goats were also commonly kept. In farms that kept sheep, the average number of sheep per farm was 4.83.

The number for farms at the food poverty line was 3.74 and for those at the poverty limit was 6.44 (Table 2). Aid to farmers by the Forest and Village Affairs Directorate (ORKOY) partially in the form of free sheep and low-interest cash loans has had a great effect on the widespread keeping of sheep by these farms. The average number of sheep kept in comparable farms in other countries is higher than that in Turkey. For example, a study carried out by the FAO in Lebanon found that the number of sheep kept by farms at the food poverty line and complete poverty line was 5 and 10, respectively (FAO, 2007b) and the equivalent numbers for goats were 5.5 and 22.5. In the farms examined, the average number of goats was 1 and 0.53 and 1.70 for farms at the food poverty line and at the complete poverty line, respectively.

Poultry keeping was carried on in the farms examined as a traditional activity. Generally chickens were kept, but in some areas geese. The average number of birds per farm was 5.11.

A certain amount of bee-keeping was found. The average number of hives per farm was 0.61, with rather more bees kept by farms at the food poverty line: an average of 0.93 hives as against 0.14 for farms at the poverty limit.

When the yields of various animal products from the farms examined were examined, it was seen that there was a difference in yield levels between farms. At the same time, the yearly amount of cow's milk per animal was seen to be less than the average for Turkey. For example, the annual milk yield for cattle of imported breeds in the farms examined was 2931.14 L (Table 3), while the average for Turkey in 2007 was 3885.77 L (Table 4). This yield, which is lower than the Turkish average, in the farms examined arises from insufficient feeding, unsuitable housing conditions and lack of attention to other factors such as animal health. The basis of these problems was found to be low income and lack of technical knowledge.

On the other hand, milk yields for sheep and goats were close to the Turkish averages. For example, milk yield per sheep in the farms examined was 43.86 L (Table 3), while the average for Turkey in 2007 was 47.76 L (Table 4). In this regard, the keeping of mixed-breed goats, which have a higher yield than local breeds, can be seen as a positive development. Thus, the average amount of milk produced per goat in the farms examined was 300.95 L (Table 3), whereas the average in Turkey for the widely kept local breeds is 107.22 L (Table 4). This result comes from the fact that low-income farms tend to specialize in keeping sheep and goats and is also affected by the government working to spread more productive breeds.

Utilization of animal products: Many of the farms examined were found to produce animal products, which, in addition to milk and milk products, included meat, eggs, honey and wool (Table 5). Looking at how these animal products are utilized, it can be seen that most are consumed by the farms themselves. Prices of animal products are high and the income and therefore purchasing power of rural people is correspondingly low,

so that the proportion of animal products that are marketed is low. The marketed proportion (or proportion sold) of products, which are generally produced in excess of the needs of country people such as cow's milk, honey and wool is greater than that of other products. The products with the greatest rate of self-consumption are yoghurt, butter, cream and eggs. Meat production was not widespread in the livestock farms. Farmers sometimes had the animals slaughtered by a butcher, thus producing carcass meat. Part of this meat was then consumed and part of it was sold to small retail butchers.

Marketing channels, prices, profit margins: It was seen that the farms examined generally used more than one marketing channel in the selling of the animal products, which they produced. This was done to take advantage of market prices and to minimize risk. For example, cow's milk was sold mainly to dairies (70.41%) but also to private firms (17.04%), cooperatives (10.07%) in local markets (2.22%) to neighbours (0.15%) and to wholesalers (0.11%) (Table 6). As with the example of cow's milk, certain

Table 2: Number of livestock on farms by income groups

Livestock type	Food poverty line farms	Complete poverty line farms	General
Cattle (Domestic)	0.80	1.18	0.95
Cattle (Culture)	0.89	3.49	1.94
Sheep	3.74	6.44	4.83
Goat	0.53	1.70	1.00
Poultry (hen,duck, goose, etc.)	4.61	5.85	5.11
Apiculture (number of hives)	0.93	0.14	0.61

Table 3: Livestock yields in farms by income groups

Livestock type	Food poverty line farms	Complete poverty line farms	General
Cow's milk (L farm^{-1})	2970.00	2874.00	2931.14
Sheep's milk (L farm^{-1})	43.41	44.17	43.86
Goat's milk (L farm^{-1})	319.50	282.40	300.95
Honey (kg farm^{-1})	20.00	10.00	15.00

Table 4: Yearly changes in milk yield in Turkey

Years	Sheep (merinos) (lt/head)	Change (%)	Goat (ordinary) (lt/head)	Change (%)	Cattle (domestic) (lt/head)	Change (%)	Cattle (croos bred) (lt/head)	Change (%)	Cattle (culture) (lt/head)	Change (%)
1991	34.48	-	61.05	-	743.68	-	2006.89	-	-2940.41	-
1992	34.18	-0.87	60.67	-0.63	743.00	-0.09	1994.38	-0.62	2958.15	0.60
1993	34.44	0.76	60.93	0.43	744.26	0.17	1986.32	-0.40	2962.60	0.15
1994	33.57	-2.54	60.51	-0.70	746.21	0.26	1986.23	0.00	2962.38	-0.01
1995	34.75	3.52	59.34	-1.93	740.67	-0.74	1985.70	-0.03	2966.64	0.14
1996	35.57	2.36	58.95	-0.66	738.87	-0.24	1964.24	-1.08	2960.18	-0.22
1997	34.78	-2.22	59.12	0.28	735.12	-0.51	1947.28	-0.86	2947.50	-0.43
1998	34.77	-0.02	60.20	1.83	737.69	0.35	1954.96	0.39	2927.88	-0.67
1999	34.09	-1.96	60.22	0.03	735.29	-0.33	1947.78	-0.37	2897.66	-1.03
2000	33.68	-1.21	60.01	-0.34	735.96	0.09	1966.44	0.96	2916.63	0.65
2001	33.00	-2.01	60.13	0.20	736.83	0.12	1961.32	-0.26	2915.66	-0.03
2002	32.08	-2.80	60.49	0.60	735.68	-0.16	1961.54	0.01	2900.92	-0.51
2003	41.46	29.27	91.48	51.22	978.04	32.94	2042.43	4.12	3107.66	7.13
2004	47.88	15.48	107.38	17.39	1317.4	234.70	2711.07	32.74	3880.65	24.87
2005	47.22	-1.38	107.33	-0.05	1315.94	-0.11	2705.89	-0.19	3884.99	0.11
2006	47.88	1.39	107.34	0.01	1316.34	0.03	2714.55	0.32	3881.31	-0.09
2007	47.76	-0.24	107.22	-0.11	1316.19	-0.01	2712.93	-0.06	3885.77	0.11
2008	47.78	0.04	107.04	-0.17	1315.42	-0.06	2714.69	0.06	3882.95	-0.07

Source: This Table was prepared according to Table 1

marketing channels were used more than others. The main marketing channels for other products were as follows: for sheep's milk, private firms (36.44%); for goat's milk and butter, dairy retailers (100 and 64.76%); for cheese, yoghurt, cottage cheese and eggs, local markets (92.32, 52.64, 78.26 and 72.53%); for honey, cooperatives (43.45%) and for wool, wholesalers (97.27%).

Examining the sale price of animal products produced by the farms examined according to marketing channels, a variation in prices can be seen (Table 7). This may be an effect of the amounts of supply and demand and the stability of demand. For example, a significant proportion of cow's milk produced (70.41%) is sold to diaries at a lower price ($0.307/L) than that paid by other channels. This is because the dairies demand for cow's milk is stable and the amount demanded is large. However, the prices paid to milk producers in Turkey are very low compared with those of other countries. For example, the price of a litre of milk paid to producers in various Mediterranean countries of the EU in 2007 was as follows: Greece, $0.63; Spain, $0.62; Italy, $0.52; France, $0.49. The price in the 25-member EU as a whole was $0.53 (€0.39) Eurostat, 2008a). The equivalent price in the Philippines was 0.40-$0.49 (May 2007-8) and in Pakistan 0.31-$0.37 (2007) (Morgan, 2008). For the farms examined in the study this price was $0.31.

Also, it was found that producers sell directly to the local market and to neighbours in order to get a better price for their products and that there was a price advantage, when they sold products like cheese, yoghurt, butter, eggs and honey directly to consumers. The generalization of this price advantage, which is obtained by the producers' own efforts, to other products is a principal aim. In this regard, the use of producers' organizations such as cooperatives was seen as important.

An efficient marketing system is one which provides the services demanded by the consumer, bringing them from the producer to the consumer at the lowest cost (Crawford, 1997). In measuring the cost of the market services provided, the marketing margin, which is a function of the difference between the retail price of an agricultural product and the price paid to the farmer, is used (Wohlgenant, 2005). Taking this function of the marketing margin into account, separate marketing margins were calculated for various animal products of the farms examined (Table 8).

When assessing results with regard to the producer's margin (the ratio of the price paid to the consumer to the retail price), it was found that the lowest margin, 35.04%, was for cow's milk that is, 35.04% of the price paid by the consumer for a litre of milk reached the producer. The products with the highest producer's margins were eggs (80.46%), yoghurt (79.36%) and cheese (73.14%). This margin is basically affected by retail demand, farm supply, marketing input prices, temporal delays on supply and demand, market strength, risk, technical changes, quality and spatial factors (Wohlgenant, 2005). At the same time, a basic aim was fair or just distribution of this margin between the various components of the marketing channel. For example, a dealer's margin of 64.96% for cow's milk shows that the marketing system is not efficient. This problem also affects the consumers. Thus, according to calculated relative margins, the price which a consumer pays for a litre of milk is 185.36% higher than the price paid to the producer. This ratio was found to be 183.33% in a study of diary farming farms in Tokat

Table 5: Utilization of animal products in the farms examined

Animals products	Amount of production	Amount consumed	Amount sold	Marketing rate (%)
Cow's milk (L farm^{-1})	5531.93	1963.84	3568.09	64.50
Sheep's milk (L farm^{-1})	958.50	636.28	322.22	33.62
Goat's milk (L farm^{-1})	425.50	306.11	119.39	28.06
Cheese (kg farm^{-1})	80.62	60.12	20.50	25.43
Yoghurt (kg farm^{-1})	252.96	249.02	3.94	1.56
Butter (kg farm^{-1})	22.24	20.98	1.26	5.66
Cream (kg farm^{-1})	25.47	25.47	-	-
Cottage cheese (kg farm^{-1})	95.86	73.50	22.36	23.32
Cow's meat (kg farm^{-1})	215.00	191.71	23.29	10.83
Sheep's meat (kg farm^{-1})	43.02	43.02	-	-
Goat's meat (kg farm^{-1})	281.13	43.63	237.50	84.48
Chicken meat (kg farm^{-1})	37.18	37.18	-	-
Eggs (number farm^{-1})	755.13	708.40	46.73	6.19
Honey (kg farm^{-1})	136.89	18.37	118.53	86.58
Wool (kg farm^{-1})	56.38	20.82	35.56	63.07

Table 6: Distribution of amounts of animal products from the farms examined sold by marketing channels (%)

Marketing channels	Percentage									
	Cow's milk (L farm^{-1})	Sheep's milk (L farm^{-1})	Goat's milk (L farm^{-1})	Cheese (kg farm^{-1})	Yoghurt (kg farm^{-1})	Butter (kg farm^{-1})	Cottage cheese (kg farm^{-1})	Eggs (number farm^{-1})	Honey (kg farm^{-1})	Wool (kg farm^{-1})
Local market	2.22	3.89	-	92.32	52.64	6.470	78.26	72.53	28.39	-
Sale to neighbours	0.15	-	-	4.84	32.16	7.190	-	27.47	28.16	2.730
Dairy retailers	70.41	15.95	100.00	-	15.20	64.760	-	-	-	-
Private firms	17.04	36.44	-	-	-	-	-	-	-	-
Cooperative	10.07	23.89	-	-	-	-	-	-	43.45	-
Wholesaler	0.11	19.83	-	2.84	-	21.580	21.74	-	-	97.270
Total	100.00	100.00	100.00	100.00	100.00	6.470	100.00	100.00	100.00	100.000

Table 7: Distribution of selling prices of animal products produced by the farms examined by marketing channels (%)

Marketing channels	Cow's milk (L farm^{-1}) ($/lt)	Sheep's milk (L farm^{-1}) ($/lt)	Goat's milk (L farm^{-1}) ($/lt)	Cheese (kg farm^{-1}) ($/kg)	Yoghurt (kg farm^{-1}) ($/kg)	Butter (kg farm^{-1}) ($/kg)	Cottage cheese (kg farm^{-1}) ($/kg)	Eggs (number farm^{-1}) ($/adet)	Honey (kg farm^{-1}) ($/kg)	Wool (kg farm^{-1}) ($/kg)
Local market	0.321	0.462	-	3.109	0.769	3.462	1.154	0.115	5.641	0.769
Sale to neighbours	0.377	-	-	3.365	1.538	3.077	-	0.103	4.231	-
Dairy retailers	0.307	0.731	0.577	-	0.769	3.077	-	-	-	0.769
Private firms	0.314	0.385	-	-	-		-	-	-	-
Cooperative	0.317	0.462	-	-	-		-	-	3.846	-
Wholesaler	0.308	0.423	-	2.692	-	3.077	1.154	-	-	0.474
Weighted average	0.310	0.510	0.577	3.149	1.025	3.186	1.154	0.108	4.780	0.592

Table 8: Marketing margins of various animal products produced by the farms examined (%)

Concept	Cow's milk	Cheese	Yoghurt	Butter	Cottage cheese	Eggs	Honey
Average selling price of farmer's $ (a)	0.310	3.149	1.025	3.186	1.154	0.108	4.780
Retail selling price $ (b)*	0.885	4.306	1.292	4.639	2.184	0.134	7.744
Absolute marketing margin $ c = (b-a)	0.575	1.157	0.267	1.453	1.031	0.026	2.964
Relative marketing margin (%) (c/a)×100	185.360	36.730	26.010	45.590	89.310	24.290	62.010
Intermediary's margin (%) (c / b)×100	64.960	26.860	20.640	31.310	47.180	19.540	38.280
Producer's (or farmer's) margin (%) (a/b)×100	35.040	73.140	79.360	68.690	52.820	80.460	61.720

*Local retail prices were used (Gumus *et al.*, 2008)

province (Uzunoz *et al.*, 2008). In some other countries, this ratio has been found to be less. For example, in a study of diary farming in India's Tamil Nadu state, a relative margin of 39.98% was found. In the same study, the producer's margin was 71.44% and the intermediary's margin was 28.56% (Rangasamy and Dhaka, 2008). In a different study in Punjab state in Pakistan, the relative margin was 26.09% for direct sales by the producer, the producer's margin was 79.31% and the intermediary's margin was 20.69%. In the Pakistan study, the relative margin, when milk was sold processed and pasteurized to consumers was 128.57% (Garcia *et al.*, 2003). Other products of the farms examined for which the relative marketing margin was high were cottage cheese (89.31%), honey (62.01%) and butter (45.59%).

CONCLUSION

The results obtained in this study show that when their marketing margins are considered, the livestock farms in the rural areas of the Aegean region do not have an efficient marketing system. In particular, the fact that the intermediary's margin on milk, the most commonly marketed product, is 65% shows that these farms' market efficiency is low. This also has a detrimental effect on the consumers of milk and milk products. Thus, it was established that the price paid by the consumer for a litre of milk is 185.36% higher than the price paid to the producer. This low producer margin (the ratio of the price paid to the producer to the retail price) also reduces the proportion of the goods produced which are marketed. For example, the fact that only 64.50% of the cow's milk produced by the farms examined was marketed (the average for Turkey is 61%) is an important indicator of this. In the 25-member European Union on the other hand, where milk is produced in intensive farms, the marketing ratio for cow's milk was 92.3% in 2007 (Eurostat, 2008b).

The main reasons for the low marketing margins obtained by the livestock farms are the many intermediaries involved in the marketing channel and the fact that farmers cannot market their products as an organization. At the same time, the lack of cold storage facilities and a cold chain logistics infrastructure for milk in the country areas where these farms are found also has an effect on keeping this margin low. In solving this problem, it is important that the producers should make use of the rural development investment support that the government provides. In this way, livestock farms in rural areas can play a role in the processing, storage, packaging and distribution of the animal products, which they produce and the margin of intermediaries (local collectors, dairy retailers, etc.) can be reduced. If these margins are reduced, this will both increase the marketing efficiency of the producers and also prevent fluctuations in retail prices.

Along with this, development of agro-tourism in rural areas could have a positive effect on the sector by contributing to direct sales of produce produced by livestock farms. Thus, initiatives could be encouraged to establish farms, where animal products are produced and directly sold to the consumer. This would enable a better utilization of animal products produced in rural areas and the removal of the margin of the intermediary between the producer and the consumer.

At the same time, diversification of products could contribute to marketing efficiency. For example, the development of products such as kephir, which has great health benefits and has recently begun to gain popularity on world markets, would increase marketing possibilities for livestock farms. Product diversification would also have a positive effect on the development of the rural areas, where the livestock farms are located.

In order to increase the marketing efficiency of rural livestock farms, various other measures, both internal and external, need to be taken. The main internal problem, which must be solved is that livestock farms must work in an economically efficient way. For example, the average gross margin for 100 L of milk produced in the livestock farms examined in this study was calculated as €20.87. In a study carried out in Ozalp in Van Province, this figure was found to be €24.33 (Dedeoglu and Yildirim, 2006). This gross margin figure fell to €8.06 in small farms, where herd size was small. The gross margin for 100 L of milk was found to be €1388 in Scotland (2007) (SAC, 2008), €1075 in Croatia, €380 in Slovakia and €243 in the Czech Republic (2003 survey results) (Berkum, 2009). When the gross margin figures for these example countries are compared with those of Turkey, a great difference can be observed. The first reason for this is that the Turkish average herd size is very small. The average herd size of farms examined in this study varied between 1.69 and 4.67 animals, whereas the number for the 25-member EU is 15, for the USA 120 and for New Zealand 322 (ECA, 2009). Along with this, milk yield per animal is very low because of factors such as deficiencies in animal welfare (feeding and housing conditions, etc.) and the fact that high-yield imported breeds of cattle have not spread sufficiently to these livestock farms. Thus, the average yield per animal in the farms examined was 2931.14 L, while the equivalent figure for the Czech Republic was 6275 L, for Hungary 6448 L, for Bulgaria 3600 L and for Croatia 3555 L (2007 survey results) (Berkum, 2009).

Another important reason why the livestock farms examined were not able to work efficiently was that variable costs, of which feed formed a substantial part (76%), was very large. This comes from the great increases in the price of feed concentrates. The ratio between milk and feed prices was 1.90 in 1990 (TUSEDAD, 2009) and had fallen to 0.99 by 2007 (DSYMB, 2009). This falling milk/feed price ratio (parity between milk and feed prices) shows that the production costs of livestock farms are rising significantly year by year.

The fact that the government does not support the food concentrate used by the farmers and that the government's milk premium support for milk produced is insufficient ($4.23 per 100 L of milk for organized producers, $2.31 per 100 L of milk for non-organized producers), are reasons why the farms cannot work in an efficient way. Also, the amount of feed concentrate use in the farms is low, which decreases milk yield per animal.

To conclude, in order to increase the marketing efficiency of rural livestock farms, it is important both to improve marketing opportunities and to solve these farms structural problems. If these two problems are not dealt with together, there seems to be little chance that their marketing efficiency can be increased. The present study took an example from the Aegean region of Turkey as an example to examine the marketing efficiency of livestock farms. It is felt that this work can serve as a guide study for research on rural development in countries, where intensive livestock is not practiced.

ACKNOWLEDGEMENTS

REFERENCES

Berkum, S.V., 2009. An Assessment of the competitiveness of the dairy supply chain in new member states, candidate and potential candidate countries. AgriPolicy Enlargement Network for Agripolicy Analysis, Final Report, 5 May, pp: 26. http://www.euroqualityfiles.net/AgriPolicy/Report%202.1/AgriPolicy%20Synthesis%20report%20Dairy%20Chain%20Analysis%20May%202009.pdf.

Crawford, I.M., 1997. Marketing Costs and Margins: Agricultural and Food Marketing Management. FAO., Africa.

DSYMB, 2009. Milk price statistics by months. http://www.dsymb.org.tr/sutfiyatlari.htm.

Dedeoglu, M. and I. Yildirim, 2006. Economic analysis of farms associatied with emek. J. Agric. Sci., 16: 39-48.

ECA. (European Court of Auditors), 2009. Have the management instruments applied to the market in milk and milk products achieved their main objectives?. Special Report No. 14. http://eca.europa.eu/portal/pls/portal/docs/1/3400301.PDF.

Eurostat, 2008a. Milk producer price. http://ec.europa.eu/agriculture/agrista/2008/table_en/42051.pdf.

Eurostat, 2008b. Deliveries of cows milk to dairies, as a proportion of cows milk production. http://ec.europa.eu/agriculture/agrista/2008/table_en/42012.pdf.

FAO, 2007a. Sustainable agriculture and rural development (SARD) policy brief (17). ftp://ftp.fao.org/SD/SDA/SDAR/sard/SARD-livestock%20-%20english.pdf.

FAO, 2007b. Household Livestock Holding and Livelihood Vulnerability Status Report on PRA and Herd Structure Study in Dollo Ado Woreda, Libane zone of Somali National Regional State. FAO., Malaysia.

Garcia, O., K. Mahmood and T. Hemme, 2003. A review of milk production in india with particular emphasis on small-scale producers. IFCN and FAO, PPLPI Working Paper, No. 3. http://www.fao.org/ag/againfo/programmes/en/pplpi/docarc/wp3.pdf.

Gumus, S., A. Olgun, H. Adanacioglu and A.H. Gumus, 2008. An Investigation on income diversification and alternative employment aiming at rural poverty alleviation. The scientific and technical research council of Turkey, project no: SOBAG- 105K07, Ankara, Turkey.

Huyen, L.T.T., D.T.T. Van, P. Herold and A.V. Zárate, 2009. Smallholder cattle production in northern mountainous Vietnam in relation with the poverty status of the household. Conference on International Research on Food Security, Natural Resource Management and Rural Development. Tropentag University of Hamburg, October 6-8.

Morgan, N., 2008. Dairy Prices, Policies and Potential Opportunities for Smallholders in Asia. FAO., Bangkok.

Musemwa, L., C. Chagwiza, W. Sikuka, G. Fraser, M. Chimonyo and N. Mzileni, 2007. Analysis of cattle marketing channels used by small-scale farmers in the Eastern Cape Province, South Africa. Livest. Res. Rural Dev., Vol. 19, No. 9.

Pesmen, G. and M. Yardýmci, 2008. The general status of Turkey's livestock within candidacy process to European Union. Vet. Hekim Der Derg, 79: 51-56.

Philipp, B., 1999. Poverty reduction project poverty-world bank and UNDP concepts. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, pp: 1-8. http://www.gtz.de/forumarmut.

Rangasamy, N. and J.P. Dhaka, 2008. Marketing efficiency of dairy products for co-operative and private dairy plants in Tamil Nadu: A comparative analysis. Agric. Econ. Res. Rev., 21: 235-242.

SAC, 2008. Assessing the Impact of Increased Feed, Fuel and Fertiliser Costs on Scottish Agriculture. SAC., Scottish.

TUSEDAD, 2009. The price statistics for milk and feed in Turkey. http://www.tusedad.org/tusedadhaberayrinti.asp?Kod=172.

TurkStat, 2008a. Results of the 2008 Poverty Study. Turkish Statistical Institute, Ankara.

TurkStat, 2008b. The Results of Animal Production Statistics. Turkish Statistical Institute, Ankara.

Uzunoz, M., A. Gulcin and A. Yasar, 2008. Cost of milk and marketing margins in dairy farms of Turkey. J. Applied Sci., 8: 1329-1332.

Wohlgenant, M.K., 2005. Marketing Margins: Empirical Analysis. Handbook of Agricultural Economics. Elsevier Science, UK., pp: 933-970.