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# Marketing Strategies of Agricultural Producers in Objective One Greek Regions: The Factors Affecting the Selection of Marketing Channels of Sheep and Goat Producers

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**Abstract.** This paper aims to examine the factors affecting the choice of marketing channel by sheep and goat farmers in the Region of East Macedonia and Thrace (EMTh) in Greece relative to the distribution of their livestock and milk produce. The survey was conducted in the spring of 2002 whereby the sample consisted of 343 sheep and goat farmers in the Region of EMTh in Greece. The effective response rate was 92%. A chi-square analysis was employed to assess the association between farm/farmer characteristics and the selection of a marketing channel. The Kruskal-Wallis non-parametric test was used to identify the relationship between each of the factors affecting the choice of marketing channel and the selection of a particular channel. Four categories of milk marketing channels and four categories of livestock marketing channels were identified. Many factors were found to be associated with the selection of milk marketing channel, including milk price, loyalty, speed of payment, degree of isolation, farm area, size of flock, volume of production, farmer's age and debt level. Factors such as livestock price, loyalty, capability of buyer to purchase large quantities of livestock/meat, speed of payment, personal relationships, size of flock and number of slaughtered lambs are associated with selection of a livestock marketing channel.

**Keywords:** Livestock Marketing Channels, Milk Marketing Channels,

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## 1. Introduction

It was argued that many agricultural economists have traditionally taken the view that marketing is a process that occurs after products leave the farm gate [1]. Farm management specialists often view production as the main function of farm management while they consider the record keeping, financial analysis and planning as supporting functions. Marketing decisions are excluded from the process, as is a mechanism to facilitate an interactive strategic approach to managing a farm business [1, 2, 3].

In the business literature there are many studies related to the business typologies and taxonomies. The two most widely referenced typologies are Miles and Snow's [4] strategic typology and Porter's generic strategies [5]. Miles and Snow [4] categorised the organisations into three basic types according to the way they behave strategically. The three categories are defender, prospector and analyser. This typology mostly characterises the organisational culture of a firm and the way each type influences the decision making of a business strategy.

The key dimension of this typology is the differentiation of an organisation through the degree of innovation in product or market development.

Two years later, Porter [5] identified three internally consistent generic strategies for creating a defensible position for the long run competitors in an industry. The three generic strategies that a firm may adopt are: (a) overall cost leadership, (b) differentiation and (c) focus.

The typologies of business strategies mentioned above cannot adequately describe the way agribusinesses behave strategically due to the varying nature of farms and the environment in which they operate. It is very difficult for example for farmers to differentiate their produce while the majority of small farm businesses impede the creation of economy of scales required for cost leadership.

On the other hand, farming businesses have to make decisions relative to the type of stock, method and timing of sales, price, payment and distribution channels in order to achieve their objectives.

Little is known about the strategic management process of farmers and particularly about the factors and the characteristics of the farm/farmers that influence them to choose a particular strategic alternative. Some studies have attempted to identify the characteristics of farmers that use particular channels and the factors that influence them to adopt a particular marketing strategy. For example, distribution risk is one factor that influences marketing decision making in the agribusiness sector. Risks that agricultural producers face have to do with decisions about the prices, quantity, quality, and the timing of delivery [2]. Transaction cost was identified as another factor, which has a significant influence in marketing decision-making[6]. The face - to - face contact between sellers and buyers as well as the option of the farmers to withdraw their animals if they are not satisfied with the prices, are some of the factors according to Jones and Steel[7] that affect farmers in choosing to market their livestock through the live auction markets. Kohls and Uhl[8] reported that many farmers in the U.S. preferred direct sales because this kind of market usually requires fewer marketing services, which means decreased marketing expenses. Grega and Ray[9] discovered that the interest for electronic marketing was derived from the following two reasons. Firstly multiple retailers were reluctant to use live auctions, because of the variable quality and the difficulty of tracing stock back to its source. Secondly, some farmers were seeking a cheaper and less stressful alternative to transport their stock to live auction markets. Age, education and farm profit are also, according to Hobbs, [10] some factors that influence farmers using a live auction market. The type of cattle, quick payment and the price received were the most important reasons for selling cattle live-weight. On the other hand, convenience and payment being directly based on carcass value, were the most popular reasons for selling dead – weight as well as the price and the long-standing relationship with the buyer.

Some other studies have sought to cluster farmers according to their strategic behaviour. Mitchell [11] examined the extent to which farmers were influenced in their livestock marketing decisions by publicly available information on prices and supplies. He argued that the acquisition of information is an essential part of the decision making process. He also argued that the problem producers face in judgement of livestock is whether to sell in live-weight or in dead-weight, and if the decision is to sell in live-weight, whether to sell by auction or privately. He found that dead-weight selling tended to be attractive to *product-orientated* farmers who were attempting to establish a product reputation. Hence, the directness of contact between seller and buyer gave easy opportunities for an exchange of information related to the type of product preferred by the buyer and the possibility of obtaining a premium payment for it. On the other hand, the *selling orientated* farmer believes that the time was well spent in attending

auctions in that it brought an additional return [11, 12]. This type of producer thinks that the advantage lies mainly in the information, which was acquired as a result of the frequent attendance at auctions, particularly with the intent of acquiring information about prices. Some selling – orientated farmers were also *market – orientated* in the sense that they were conscious of the need to adjust their product to the demands of the market. For these agricultural producers, attendance at auctions had an additional importance as it gave them the opportunity to gain information about market preferences. McLay *et al*, [1] identified five strategic groups according to the strategy crop farmers use in New Zealand. Feka, Xouris and Tsiotras [13] clustered dairy processors in nine strategic groups according to their size and degree of diversification, while Ohlmer, Olson and Brehmer [14] clustered Swedish farmers in relation to their decision making.

Hence, factors such as farm size, debt requirements, type of farmer's occupation, sources of information, farmer's focus on production flexibility, achievement of low production cost and farmer's market knowledge, might influence the decision making relative to marketing strategies in the agribusiness sector. Factors such as the distribution risk, transaction cost and other forces relative to the external environment e.g. legislative restrictions, economic pressures and technological advantages etc. also have a significant impact on marketing decision-making. However, little is known about the strategic management process of farmers and particularly about the factors and the farmers' characteristics that influence them to choose a particular strategic alternative. This paper investigates the way that farm and farmer's characteristics affect the selection of a marketing strategy and more specifically, the choice of a particular distribution pattern.

## 2. Methodology

Due to the limited understanding of the factors and farm / farmer's characteristics that influence agricultural enterprises to choose a particular marketing channel for the distribution of their produce, the present study was empirical rather than conceptual. To conduct an empirical analysis it was necessary to collect primary data that described the attitudes of individual farmers towards marketing variables.

A survey of sample farms was conducted to gather the necessary data for the identification of the marketing channels that sheep and goat farmers use in the Region of East Macedonia and Thrace (EMTh) regarding milk and meat (livestock) marketing. Another purpose for this survey was to explore the relationship between various variables and the marketing orientations of farm businesses.

Field interviews were used for data collection, as this method was considered more appropriate where the respondent is unfamiliar with the research subject, has poor literacy, faces language difficulties or is quite old or very young [15, 16, 17, 18]. In this study where most sheep and goat farmers in the Region of East Macedonia had poor literacy and were not familiar with this kind of research, field interviews provided the interviewer with the opportunity to explain the utility of the project and its aims and objectives. The length of the questionnaire, the size of the sample and the dispersion of the farms were some of the factors worked towards the adoption of the interview method.

A number of different types of variables were identified. Some of them were related to the identification of livestock and milk marketing channels. Others were related to the factors and the farm/farmer characteristics influencing the marketing channel selection and were used to develop the profiles of each marketing channel.

The questionnaire also included questions that concerned the use of marketing channels, choice criteria, agricultural cooperative membership and sales price regarding livestock and milk marketing. More specifically, these questions were used to determine the channel utilization, to identify the relation between various factors and to select a particular marketing strategy after bivariate statistical analysis.

Questions were constructed to identify farm and farmer characteristics such as farm and non-farm previous working experience, income, debt level, age and education. This part was also of particular relevance with regard to the profiling of each marketing channel.

A sample frame including information on 6,826 farmers who operate in the Region of EMTh was obtained from the Local Authorities in the Region of EMTh. A random selection of 343 sheep and goat farmers was chosen to form the sample. The random sample was attributed to the fact that the author wished to be able to generalize his findings beyond the sample of farms questioned in this survey. As Errington [19] has argued the only way to achieve this is to ensure that the units for the survey are selected at random from a large population from which generalizations are to be made.

The survey which was pre-tested and piloted was conducted in the spring of 2002 and had a productive response rate of 92%.

In this study the Kruskal–Wallis non-parametric test was used in order to identify the factors that are related to the farmers' selection of a particular marketing channel because all the examined variables were ordinal [20]. Since some of the variables were qualitative, the chi-square test of independence was also employed to explore the relationship between the farm/farmer characteristics and the particular livestock and milk marketing channel was chosen by the farmer.

### 3. The utilization of livestock marketing channels by sheep and goat farmers in Greece (Region of EMTh)

#### 3.1 Description of sheep and goat livestock marketing channels in Greece (Region of EMTh)

Ten marketing channels were identified from the survey. Five of them are direct channels and five are multiple channels of two or more direct channels as detailed in Table 1.

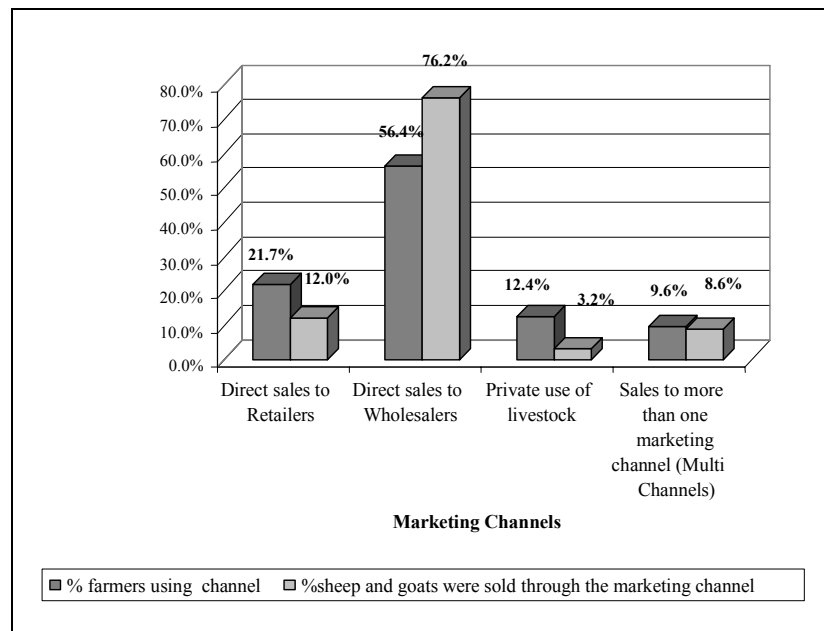
Initial chi-square tests of associations between channel selection and associated variables proved to be invalid because of low expected values [21, 20]. It was therefore necessary to merge channels to achieve valid results. Hence the following four categories of marketing channels were identified as illustrated in Figure 1.

#### 3.2 Factors affecting the selection of livestock marketing channel by sheep and goat farmers in Greece (Region of EMTh)

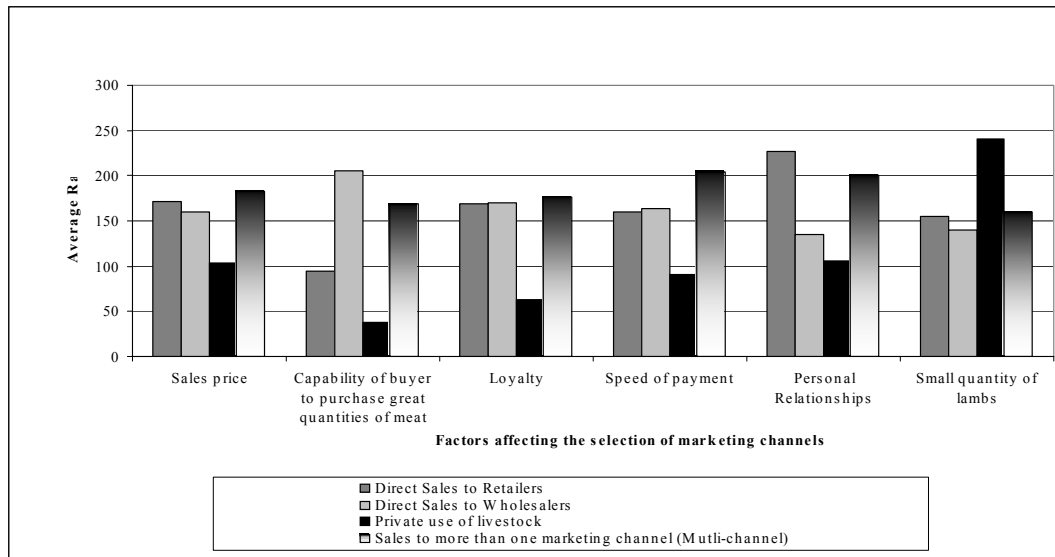
The Kruskal–Wallis non-parametric test indicated that there was a highly significant relationship ( $P < 0.001$ ) between sales price of livestock, capability of buyer to purchase large quantities of livestock, loyalty, speed of payment, personal relationships, quantity of lambs, and the selection of a particular marketing channel. The relationship between each factor and the selection of a particular marketing channel is illustrated in figure 2. The Q test which is the equivalent non parametric Tukey test was conducted to determine the detail of the difference between the marketing channels [22]. The results of the test are presented in table 2.

**Table 1.** Market channel selection and utilization for sheep and goat producers regarding livestock marketing.

| Description of marketing channel  | Farmers used the marketing channel | Number (heads) of sheep and goats sold through the marketing channel |
|---|------------------------------------|--|
| <b>Direct Channel Selection</b>   |                                    |  |
| 1 Direct sales to Retailers   | 68 (21.7%)                         | 6,122 (12.0%)  |
| 2 Direct sales to wholesalers   | 177 (56.7%)                        | 38,978 (76.2%)   |
| 3 Direct sales to consumers (in live weight)  | 17 (5.4%)                          | 1197 (2.3%)  |
| 4 Self consumption  | 19 (6.1%)                          | 331 (0.7%)   |
| 5 Direct sales to other farmers in livestock (for breeding)                                       | 3 (1.0%)                           | 104 (0.2%)   |
| <b>Multi-channel selection</b>  |                                    |  |
| 6 Direct sales to Retailers + Direct sales to Wholesalers   | 18 (5.7%)                          | 3,473 (6.8%)   |
| 7 Direct sales Retailers + Direct sales to Consumers (livestock)                                  | 8 (2.6%)                           | 738 (1.4%)   |
| 8 Direct sales to Wholesalers + Direct sales to Consumers (livestock)                             | 1 (0.3%)                           | 36 (0.1%)  |
| 9 Direct sales to Consumers (livestock) + Self consumption  | 2 (0.6%)                           | 30 (0.1%)  |
| 10 Direct sales to Retailers +Direct sales to Wholesalers + Direct sales to Consumers (livestock) | 1 (0.3%)                           | 131 (0.3%)   |
| <b>TOTAL</b>  | <b>314 (100%)</b>                  | <b>51,140 (100%)</b>   |



**Figure 1.** Categorization of sheep and goat marketing channels regarding livestock marketing.



**Figure 2.** Factors affecting the selection of a particular livestock marketing channel.

Hence, factors such as sales price and capability of the farmer to purchase large quantities of livestock mostly influenced the sheep and goat farmers in the Region of EMTh in Greece to market their livestock to more than one marketing channel as well as to wholesalers while loyalty affected these farmers in distributing their produce to more than one marketing channel or directly to wholesalers or retailers. Finally, personal relationships mostly influenced the sheep and goat farmers to place their produce directly to retailers while the small quantity of lambs affected them to make private use of their livestock.

Through the chi-square test of independence it was found that there is a highly significant relationship ( $P < 0.001$ ) between the selection of a particular marketing channel and the size of the flock, the number of slaughtered animals, the volume of milk production and the financial performance. The relationship between size of cultivated land allocated to sheep and goat enterprise and the selection of a marketing channel was also significant at  $P = 0.013$ .

The strength of the association between each farm/farmers characteristics and each marketing channel can be examined by the standardized residuals in each cell in the cross tabulation matrix [22]. The table below illustrates the profile of the farmers who adopt a particular livestock marketing channel taking into consideration the highest positive standardised residuals in each characteristic.

Thus, the farmers who preferred to market their livestock directly to retailers had medium size flocks, were small scale livestock and medium scale milk producers; they allocated between 31%-60% of their land to their sheep and goat enterprise and their financial performance was below average. Farmers who preferred the direct sales to wholesalers had big flock, were large scale livestock and milk producers, allocated more than 61% of their land to their livestock enterprise and earned an above average financial income. Sheep and goat farmers with small flocks, low volume of livestock and milk production, with low allocation of land to their sheep and goat enterprise as well as with low financial performance, preferred the private use of their livestock. Finally, farmers with small flocks but with large volume of livestock and milk production have chosen to market their livestock produce to more than one marketing channel. These farmers were also allocated more than 61% of their land to their sheep and goat enterprise and their financial performance was above average.

**Table 2.** The results of the Q statistic test for the determination of the association between the livestock marketing channels regarding each factor.

| Dependent Variable  | (I) Marketing Channels      | (J) Marketing Channels                   | Q statistic (I-J) | Critical z value | Sig   |
|---|-----------------------------|--|-------------------|------------------|-------|
| Sales Price   | Direct Sales to Retailers   | Direct Sales to Wholesalers              | 7.876             | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Private Use of Livestock                 | 24.342            | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Sales to more than one marketing channel | -3.458            | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Private Use of Livestock                 | -26.264           | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Sales to more than one marketing channel | -1.653            | 2.639            | >0.05 |
|   | Private Use of Livestock    | Sales to more than one marketing channel | -19.470           | 2.639            | <0.05 |
| Capability of Buyer to purchase large quantities of livestock | Direct Sales to Retailers   | Direct Sales to Wholesalers              | -64.079           | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Private Use of Livestock                 | 16.309            | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Sales to more than one marketing channel | -18.012           | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Private Use of Livestock                 | -62.715           | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Sales to more than one marketing channel | 2.224             | 2.639            | >0.05 |
|   | Private Use of Livestock    | Sales to more than one marketing channel | -25.830           | 2.639            | <0.05 |
| Loyalty   | Direct Sales to Retailers   | Direct Sales to Wholesalers              | -0.981            | 2.639            | >0.05 |
|   | Direct Sales to Retailers   | Private Use of Livestock                 | 35.220            | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Sales to more than one marketing channel | -2.135            | 2.639            | >0.05 |
|   | Direct Sales to Wholesalers | Private Use of Livestock                 | -46.051           | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Sales to more than one marketing channel | -0.418            | 2.639            | >0.05 |
|   | Private Use of Livestock    | Sales to more than one marketing channel | -25.834           | 2.639            | <0.05 |
| Speed of Payment  | Direct Sales to Retailers   | Direct Sales to Wholesalers              | -1.948            | 2.639            | >0.05 |
|   | Direct Sales to Retailers   | Private Use of Livestock                 | 18.755            | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Sales to more than one marketing channel | -10.295           | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Private Use of Livestock                 | -25.450           | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Sales to more than one marketing channel | -2.304            | 2.639            | >0.05 |
|   | Private Use of Livestock    | Sales to more than one marketing channel | -21.217           | 2.639            | <0.05 |
| Personal Relationships  | Direct Sales to Retailers   | Direct Sales to Wholesalers              | 49.837            | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Private Use of Livestock                 | 33.060            | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Sales to more than one marketing channel | 6.122             | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Private Use of Livestock                 | -10.208           | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Sales to more than one marketing channel | -3.648            | 2.639            | <0.05 |
|   | Private Use of Livestock    | Sales to more than one marketing channel | -17.631           | 2.639            | <0.05 |
| Small quantity of lambs                                       | Direct Sales to Retailers   | Direct Sales to Wholesalers              | 8.604             | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Private Use of Livestock                 | -23.232           | 2.639            | <0.05 |
|   | Direct Sales to Retailers   | Sales to more than one marketing channel | -1.169            | 2.639            | >0.05 |
|   | Direct Sales to Wholesalers | Private Use of Livestock                 | 35.553            | 2.639            | <0.05 |
|   | Direct Sales to Wholesalers | Sales to more than one marketing channel | -1.172            | 2.639            | >0.05 |
|   | Private Use of Livestock    | Sales to more than one marketing channel | 14.942            | 2.639            | <0.05 |



**Table 3.** Farmer profiles - The characteristics of farmers adopting different livestock marketing channels

| Direct sales to retailers  | Direct sales to wholesalers                                       | Private use of livestock  | Sales to more than one marketing channels                         |
|--|---|---|---|
| Size of flock:51-150 heads **  | Size of flock:151+ heads ***                                      | Size of flock: <50 heads ***  | Size of flock: <50heads*  |
| Volume of slaughtered sheep and goats (all ages): <50 heads ***      | Volume of slaughtered sheep and goats (all ages): 151+ heads ***  | Volume of slaughtered sheep and goats (all ages): <50 heads ***     | Volume of slaughtered sheep and goats (all ages): 151+ *          |
| Milk produce: 2.001-10.000 kg *                                      | Milk produce: 10.001+ kg **                                       | Milk produce: <2000 kg ***  | Milk produce: 10001+ kg *   |
| Percentage of land allocated to sheep and goat enterprise: 31%-60% * | Percentage of land allocated to sheep and goat enterprise: 61%+ * | Percentage of land allocated to sheep and goat enterprise: <30% *** | Percentage of land allocated to sheep and goat enterprise: 61%+ * |
| Financial Performance: Bellow average**                              | Financial Performance: Above average***                           | Financial Performance: Bellow average***                            | Financial Performance: Above average*                             |

\* Standardized residuals: 0-1.5 (low positive association); \*\* Standardized residuals : >1.5 and <1.9 (medium positive association); \*\*\* Standardized residuals: >1.9 (strong positive association)

#### 4. The utilization of milk marketing channels by sheep and goat farmers in Greece (Region of EMTh)

##### 4.1 Description of sheep and goat milk marketing channels in Greece (Region of EMTh)

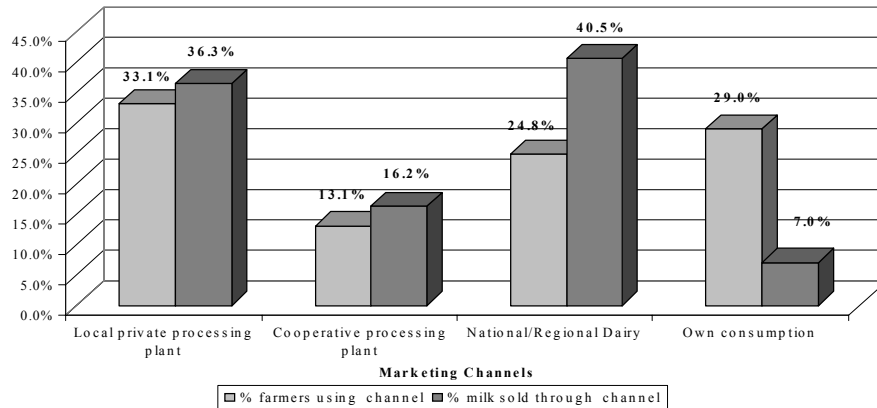
Seven milk marketing channels were identified from the survey and all of them are direct marketing channels as detailed in table 4.

**Table 4.** Market channel selection and utilisation for sheep and goat producers regarding milk marketing

| Description of marketing channel                     | Farmers used each marketing channel | Quantity of milk (kg) sold through each marketing channel |
|--|-------------------------------------|---|
| 1 Sales to local private milk processing plant       | 104 (33.1%)                         | 1,046,630 (36.3%)   |
| 2 Sales to cooperative milk processing plant         | 41 (13.1%)                          | 466,400 (16.2%)   |
| 3 Sales to big national and regional dairy companies | 78 (24.8%)                          | 1,167,305 (40.5%)   |
| 4 Feed to lambs or yearlings                         | 70 (22.3%)                          | n/a   |
| 5 Self-consumption                                   | 12 (3.8%)                           | 151,311 (5.3%)  |
| 6 Reward to person who tends the flock               | 4 (1.3%)                            | 1,700 (0.1%)  |
| 7 Processing and sale of the milk                    | 5 (1.6%)                            | 50,00 (1.7%)  |
| TOTAL  | 314 (100%)                          | 2,883,346 (100%)  |

Initial chi-square tests of associations between channel selection and associated variables proved to be invalid because of low expected values [20, 21]. It was therefore necessary to

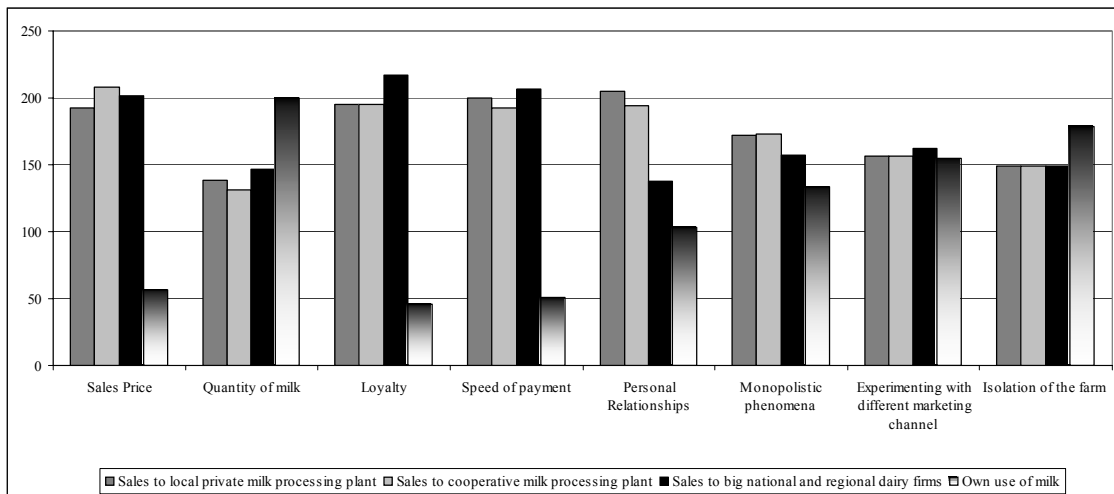
merge channels to achieve valid results. Hence the following four categories of milk marketing channels were identified as the figure 3 represents.



**Figure 3.** Categorization of sheep and goat milk marketing channels.

#### 4.2 Factors affecting the selection of milk marketing channel by sheep and goat farmers in Greece (Region of EMTh)

The use of Kruskal–Wallis non parametric ANOVA proved that there was a highly significant relationship ( $P < 0.001$ ) between the sales price of milk, loyalty, personal relationships, quantity of milk, speed of payment, monopolistic phenomena, isolation of the farm and the selection of a particular marketing channel. A significant relationship ( $P = 0.030$ ) was identified between “experimenting with different marketing channels” and the selection of a particular marketing channel. The relationship between each factor and the selection of a particular marketing channel is illustrated in Figure 4. The Q test was conducted to determine the detail of the difference between the marketing channels. The results of the test are presented in Table 5.



**Figure 4.** Factors affecting the selection of a particular milk marketing channel.

**Table 5.** The results of the Q statistic test for the determination of the association between the milk marketing channels in relation to each factor.

| Dependent Variable     | (I) Marketing Channels                        | (J) Marketing Channels                        | Q statistic (I-J) | Critical z value | Sig   |
|------------------------|---|---|-------------------|------------------|-------|
| Sales Price            | Sales to local private milk processing plant  | Sales to cooperative milk processing plant    | -5.451            | 2.639            | <0.05 |
|                        | Sales to local private milk processing plant  | Sales to big regional or national dairy firms | -4.783            | 2.639            | <0.05 |
|                        | Sales to local private milk processing plant  | Own use of milk                               | 80.963            | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Sales to big regional or national dairy firms | -2.097            | 2.639            | >0.05 |
|                        | Sales to cooperative milk processing plant    | Own use of milk                               | 9.854             | 2.639            | <0.05 |
|                        | Sales to big regional or national dairy firms | Own use of milk                               | 74.571            | 2.639            | <0.05 |
| Milk Quantity          | Sales to local private milk processing plant  | Sales to cooperative milk processing plant    | 3.285             | 2.639            | <0.05 |
|                        | Sales to local private milk processing plant  | Sales to big regional or national dairy firms | -4.672            | 2.639            | <0.05 |
|                        | Sales to local private milk processing plant  | Own use of milk                               | -41.029           | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Sales to big regional or national dairy firms | 5.819             | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Own use of milk                               | -5.088            | 2.639            | <0.05 |
|                        | Sales to big regional or national dairy firms | Own use of milk                               | -31.104           | 2.639            | <0.05 |
| Loyalty                | Sales to local private milk processing plant  | Sales to cooperative milk processing plant    | 0.102             | 2.639            | >0.05 |
|                        | Sales to local private milk processing plant  | Sales to big regional or national dairy firms | -11.427           | 2.639            | <0.05 |
|                        | Sales to local private milk processing plant  | Own use of milk                               | 84.001            | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Sales to big regional or national dairy firms | 6.983             | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Own use of milk                               | 9.183             | 2.639            | <0.05 |
|                        | Sales to big regional or national dairy firms | Own use of milk                               | 83.461            | 2.639            | <0.05 |
| Speed of Payment       | Sales to local private milk processing plant  | Sales to cooperative milk processing plant    | 2.494             | 2.639            | >0.05 |
|                        | Sales to local private milk processing plant  | Sales to big regional or national dairy firms | -3.142            | 2.639            | <0.05 |
|                        | Sales to local private milk processing plant  | Own use of milk                               | 79.866            | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Sales to big regional or national dairy firms | 4.174             | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Own use of milk                               | 8.298             | 2.639            | <0.05 |
|                        | Sales to big regional or national dairy firms | Own use of milk                               | 72.076            | 2.639            | <0.05 |
| Personal Relationships | Sales to local private milk processing plant  | Sales to cooperative milk processing plant    | 3.563             | 2.639            | <0.05 |
|                        | Sales to local private milk processing plant  | Sales to big regional or national dairy firms | 33.040            | 2.639            | <0.05 |
|                        | Sales to local private milk processing plant  | Own use of milk                               | 54.688            | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Sales to big regional or national dairy firms | -16.665           | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Own use of milk                               | 5.346             | 2.639            | <0.05 |
|                        | Sales to big regional or national dairy firms | Own use of milk                               | 16.192            | 2.639            | <0.05 |
| Monopolistic Phenomena | Sales to local private milk processing plant  | Sales to cooperative milk processing plant    | -0.194            | 2.639            | >0.05 |
|                        | Sales to local private milk processing plant  | Sales to big regional or national dairy firms | 7.266             | 2.639            | <0.05 |
|                        | Sales to local private milk processing plant  | Own use of milk                               | 20.795            | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Sales to big regional or national dairy firms | -4.559            | 2.639            | <0.05 |
|                        | Sales to cooperative milk processing plant    | Own use of milk                               | 2.313             | 2.639            | >0.05 |
|                        | Sales to big regional or national dairy firms | Own use of milk                               | 11.149            | 2.639            | <0.05 |

Table 5. Continued

| Dependent Variable                              | (I) Marketing Channels                        | (J) Marketing Channels                        | Q statistic (I-J) | Critical z value | Sig   |
|---|---|---|-------------------|------------------|-------|
| Experimenting with different marketing channels | Sales to local private milk processing plant  | Sales to cooperative milk processing plant    | 0.000             | 2.639            | >0.05 |
|   | Sales to local private milk processing plant  | Sales to big regional or national dairy firms | -2.946            | 2.639            | <0.05 |
|   | Sales to local private milk processing plant  | Own use of milk                               | 0.909             | 2.639            | >0.05 |
|   | Sales to cooperative milk processing plant    | Sales to big regional or national dairy firms | 1.776             | 2.639            | >0.05 |
|   | Sales to cooperative milk processing plant    | Own use of milk                               | 0.100             | 2.639            | >0.05 |
|   | Sales to big regional or national dairy firms | Own use of milk                               | 3.562             | 2.639            | <0.05 |
| Isolation of the farm                           | Sales to local private milk processing plant  | Sales to cooperative milk processing plant    | 0.000             | 2.639            | >0.05 |
|   | Sales to local private milk processing plant  | Sales to big regional or national dairy firms | 0.000             | 2.639            | >0.05 |
|   | Sales to local private milk processing plant  | Own use of milk                               | -7.377            | 2.639            | <0.05 |
|   | Sales to cooperative milk processing plant    | Sales to big regional or national dairy firms | 0.000             | 2.639            | >0.05 |
|   | Sales to cooperative milk processing plant    | Own use of milk                               | -0.808            | 2.639            | >0.05 |
|   | Sales to big regional or national dairy firms | Own use of milk                               | -6.384            | 2.639            | >0.05 |

Hence, sales price influenced the sheep and goat farmers in the Region of EMTh in Greece to market their milk produce to a cooperative milk processing plant as well as to big national and regional dairy firms. The quantity of milk influenced these farmers to determine their own use for the milk, while loyalty and speed of payment were two factors that stimulated them to sell their milk to big national and regional dairy firms. Personal relationships influenced the sheep and goat farmers to market their milk to the local milk processing plant. On the other hand, some farmers preferred to distribute their milk to cooperative or local private milk processing plants or to make personal use of their milk due to monopolistic phenomena. Farmers who wanted to experiment with different marketing channel preferred to sell their milk to big regional dairy firms or to cooperative milk processing plants. Finally the isolation of the farm is a factor that affected these farmers to make own use of their milk or market it to cooperatives milk processing plants that could afford the cost in order to collect milk for some isolated place.

The chi-square analysis identified a highly significant relationship ( $P < 0.001$ ) between the selection of a particular marketing channel and the size of flock, volume of milk production, level of debt, size of cultivated land allocated to the sheep and goat enterprise and financial performance. The relationship between the size of farm and the selection of a marketing channel was significant at  $P = 0.032$  while the relationship between farmers' age and the selection of a marketing channel was significant at  $P = 0.028$ .

Table 6 illustrates the profile of farmers adopting a particular marketing channel, taking into consideration the highest positive standardised residuals in each characteristic.

Farmers who preferred to market their milk to local private milk processing plants cultivated less than 4.9 ha, were medium size livestock farmers with a medium volume of livestock and milk production. They were middle aged (51-60 years old), medium indebted (10-29% of their income), with average financial performance and allocated more than 61% of their land to their sheep and goat enterprise. The sheep and goat farmers that sold their milk to cooperative processing plants cultivated less than 4.9 ha, were medium scale livestock and milk producers and were less than 40 years old. They were highly indebted with an average financial performance and with medium allocation of their land to their sheep and goat enterprise. On the other hand, farmers who marketed their milk to big national / regional dairy firms were

large scale farmers in terms of cultivated land, size of flock, volume of livestock and milk production. They were between 41-50 years old, highly indebted, with an above average financial performance and low allocation of their land to their livestock enterprise. Finally, the farmers who self - consumed their milk, were small scale farmers in terms of cultivated land, size of flock, volume of livestock and milk production. They were quite old, not highly in debt, with a below average financial performance and they did not allocate any land to their sheep and goat enterprise.

**Table 6.** Farmer profiles - The characteristics of farmers adopting the different milk marketing channels

| <b>Local private processing plant</b>                            | <b>Cooperative processing plant</b>                                | <b>National / Regional dairy</b>                                    | <b>Own consumption</b>  |
|--|--|---|---|
| Size of cultivated land: <4.9 ha *                               | Size of cultivated land: <4.9 ha *                                 | Size of cultivated land: 10+ha ***                                  | Size of cultivated land: <4.9 ha *  |
| Size of flock: 51-150 heads **                                   | Size of flock: 151+ heads **                                       | Size of flock: 151+ heads **  | Size of flock: <50heads ***   |
| Livestock production: 51-150 heads *                             | Livestock production: 51 - 150 heads *                             | Livestock production: 151+ heads ***                                | Livestock production: <50 heads***  |
| Milk produce: 2.001-10.000 kg ***                                | Milk produce: 2.001+10.000 kg *                                    | Milk produce: 10.001+ kg ***  | Milk produce: <2.000 kg ***   |
| Age: 51-60 years *   | Age: < 40 years *  | Age: 41-50 years *  | Age: 61+ years***   |
| Debt: 10-29%*  | Debt: 30%+ *   | Debt: 30%+ *  | Debt: 0-9%***   |
| Percentage of land allocated to sheep and goat enterprise: 61%+* | Percentage of land allocated to sheep and goat enterprise: 31-60%* | Percentage of land allocated to sheep and goat enterprise: <30% *** | Percentage of land allocated to sheep and goat enterprise: Do not farm any land.*** |
| Financial Performance: Average***                                | Financial Performance: Average*                                    | Financial Performance: Above Average***                             | Financial Performance: Bellow Average***  |

\* Standardized residuals: 0-1.5 (low positive association); \*\* Standardized residuals : >1.5 and <1.9 (medium positive association); \*\*\* Standardized residuals: >1.9 (strong positive association)

## 5. Conclusion

Many factors and farm/farmer characteristics were found to be associated with the selection of a particular livestock and milk marketing channel.

Factors such as price, loyalty, speed of payment, personal relationships and volume of production, were found to influence the sheep and goat farmers in the Region of EMTh in Greece to select a livestock and milk marketing channel. The capability of a buyer to purchase large quantities of livestock, influenced these farmers to choose only a livestock marketing channel. On the other hand, the experimentation with different marketing channels and the isolation of the farm affected farmers only in their selection of a milk marketing channel.

The relationship between the selection of a particular livestock or milk marketing channel and factors such as the fact that: (i) farmers were not interested in selling their livestock or milk produce, (ii) they used the same marketing channel for many years and (iii) the local community used the same marketing outlet, were not significant ( $P>0.05$ ). No significant association between factors such as the preference of the farmer to sell in live-weight, local demand, lack of space for housing of the lambs, the invoice issued by the wholesalers and the

selection of a particular livestock marketing channel was identified. The association between the selection of a milk marketing channel and factors such as the lack of milk buyer in the farm's region, the willingness of the farmer to add value to his product, the easy delivery of the produced milk to the milk buyer and the preference of the farmer to use the same buyer for his sheep/goat and cow milk is not significant either ( $P>0.05$ ).

Farm and farmer's characteristics such as the size of the flock, volume of livestock and milk production, size of cultivated land which is allocated to sheep and goat enterprise and financial performance, were associated with the selection of a livestock and milk marketing channel. Characteristics such as the size of the farm, and farmer's age and debt, were only associated with the selection of a milk marketing channel.

No significant association ( $P>0.05$ ) was found between the farm and farmer's characteristics such as livestock experience, experience in decision making, membership of agricultural cooperative, farm income related to sheep and goat enterprise, off farm activities, previous non farm experience and the selection of a particular milk or livestock marketing channel.

Examining the profile of each livestock marketing channel, it can be concluded that farmers who preferred the direct sales to retailers were small scale livestock and medium scale milk producers, their flock was medium, allocated between 31-60% of their cultivated land to their sheep and goat enterprise and their financial performance was below average. Farmers who preferred the direct sales to wholesalers were large scale livestock and milk producers, their flock was big, allocate more than 61% of their cultivated land to their sheep and goat enterprise and their financial performance was above average. On the other hand, farmers who preferred private use of their produce were small scale livestock and milk producers, their flock was small, they allocated less than 30% of their cultivated land to their sheep and goat enterprise and their financial performance was low. Finally, those who preferred the sales to more than one marketing channel (multi -channel) were large scale milk producers, their flock was small, they allocated more than 61% of their cultivated land to their sheep and goat enterprise and the financial performance of their farm was above average.

Regarding the profile of each milk marketing channel, it was found that farmers who prefer to sell to local processing plants were medium scale livestock and milk producers, middle aged farmers, had medium size flock, allocated more than 61% of their land to their sheep and goat enterprise, had incurred a debt between 10-29% of their income and earned average financial rewards. Farmers who used the cooperative processing plants as an outlet were medium scale livestock and milk producers, young farmers, had a large flock, allocated more than 61% of their land to their sheep and goat enterprise and had incurred substantial debt whilst their financial performance was average. On the other hand, farmers that preferred to market their milk produce to big dairies were large scale milk and livestock producers, middle aged farmers, had a large flock, allocated less than 30% of their land to their sheep and goat enterprise and had a high debt and above-average financial performance. Finally, farmers who self-consumed their milk produce were small scale milk and livestock producers, were old in age, had a small flock, allocated none of their land to the sheep and goat enterprise and had a debt of less than 10% of their income.

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