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# **IMPACT ASSESSMENT ON MILK INCENTIVE POLICIES IN TURKEY: ANTALYA PROVINCE CASE**

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the lessons learned."**

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## ABSTRACT

Agricultural policy instruments are implementing in different ways among all agricultural based activities. These instruments have been performed for livestock including dairy cattle and milk for many years in Turkey. Until the year 1950, agricultural support system was organized according to genetically improvement, animal illnesses and veterinary services. Nowadays, agricultural support composition has changed. Milk incentive premium is one of the supports given to producers to achieve high quality level for milk. The idea behind this premium was to provide well organized milk distribution channel from producers to modern enterprises. In this study, producers who receive milk incentive premium were chosen for face to face survey in Antalya province. It was examined from the study if premium system is accomplished through the idea. The secondary outcomes of the research were to determine the influence of the premium on producer's attitudes, income level, product quantity, as well as membership tendency for cooperatives or unions.

**Keywords:** milk incentive premium, milk marketing, producer surplus, Antalya

## 1 INTRODUCTION

Agricultural activities are needed to be supported by different ways and aim due to its nature and importance for human nutrition. There are many policy instruments been used for doing accomplish the improvement of agricultural sector and relevant actors involved. Some agricultural policies are allocated according to regional and economical reasons. In Turkey, livestock sector of agriculture has prominently taken place in economy.

Among livestock products, milk as sub-sector is in Turkey because it is important for a balanced and healthy diet, the development of the dairy industry, regional development, increased agricultural productivity and rural development. The amount of milk production in Turkey is estimated as approximately 9.5 to 10 million tons. Milk prices in Turkey are determined in free market independently; in addition, milk factories have a great effect on prices (UZMAY 2004).

The aim of this study is to assess the impact of milk incentive policies on producers. With this objective, different measures are computed to evaluate this policy. It has begun in the first material and methods part of the study by introducing and describing the milk sector policies and their relevant policy analyses models with macro data in Turkey. It is benefited relevant econometric models from previous studies have done in Turkey. In the result and discussion session of the study, observations were presented by using graphs and tables based on the survey results. It was discussed in this part, expectation of the survey results and if premium system was accomplished through the idea. Therefore, outcomes of the research were to determine the influence of this premium on producer's attitudes, income level, product quantity, as well as membership tendency for cooperatives or unions. At last, the study was summarized with concluding remarks.

## 2 MATERIAL AND METHODS

### 2.1 Macro economic data models

Empirical part of the study contains mainly two parts. For the first part, general aspects of milk incentive policies affect on whole Turkish producers were examined. Therefore, macro economic sector models have been used in previous studies. In this study, we have progressed and evaluate by highlighting the milk incentive premium in addition calculated total cost for the entire economy.

### 2.2 Survey type and respondent choosing

Materials of this study were obtained from producer who receive milk incentive premium were chosen. Survey method has done with face to face questionnaire by producers in Antalya Province (Figure 1). Antalya is generally recognized with the fruit and vegetable production but especially in the north part of the city, dairy cattle and animal husbandry is also important. Annually, there is approximately 250,000 ton raw milk production in Antalya (SAYIN et al. 2007).

Figure 1: Research area in Turkey



Raw milk is provided from cattle (217,000 ton), sheep and goat (25,000 ton). Respondents (producers) were classified into two groups initially. The total number of producers participated to survey study is 154. Some of these producers (82) prefer selling raw milk to “milk collection stations” or while the other producers (74) sell by themselves or milkmen the street. Milk collection stations may belong to semi public agricultural cooperatives. Livestock polices are arranged according to marketing conditions of milk and registration issues. The main problem about milk market is registration<sup>1</sup> in Antalya because about 3,000 ton milk is being sold without receipted everyday. Therefore, traceability of milk distribution and food safety couldn’t have provided. For that reason, government has given the milk premium to provide the milk distribution to modern enterprises and prevent the unregistered milk (SAYIN et al. 2007).

<sup>1</sup> Registration is used for selling milk to any enterprises with receipt or invoice.

## 2.3 Methodological steps of the study

Impact Assessment (IA) is a process of systematic and objective identification of the effects such as short and long-term, positive and negative, direct or indirect, intended or unintended, primary and secondary. IA helps to understand the extent to which objectives are fulfilled and activities have an effect on people's welfare (LA ROVERE 2006). Impact assessment is also a type of evaluation that is intended to determine the consequences of an intervention, in terms of outcomes of interest. This analysis can either be *ex-ante*, conducted before the intervention has been initiated and/or outcomes have been produced, or *ex-post*, which measures outcomes that have actually resulted from the intervention to date (CGIAR 2007). There are many *impact assessment methods* to measure the impact according to subject and aims. One of these methods is "Economic Surplus Method". It is used the concepts of demand, supply, and equilibrium and economic welfare to producers and consumers. Demand and supply may be defined at farm, retail, intermediate or aggregate stage of marketing (AMEGBETO 2006).

## 3 RESULTS AND DISCUSSION

### 3.1 Milk Incentive Premium: concept and aim

Turkish Government introduced a milk price premium for producers since 1987. The premium support is based on the Decree No. 2004/6946 and 2005/8670 and yearly adopted Premium Communiqué (for the year 2004: No 2004/36). Milk incentive premium is one of the most important policy tools for the milk producers. If producers sell milk to modern companies (enterprises) and able to meet specific criteria, they may receive a price premium on a per-liter basis. The objective is to increase the production of products with shortage of supply. Premium payments are provided directly to producers once per production period. Milk incentive premiums are paid to support dairy husbandry, raise the income level of producers, update related technology, and offer consumers better quality milk and dairy products. The objectives of the policy are also to improve the quality of milk marketing, and to reduce the sale of milk without packing and registering. On the other hand, the premium an income transfers to dairy farmers. The price premium was removed in 1995 but was introduced again in 1995. Then premium is arranged according to governmental decree (KOC et al. 2000). A support premium of TRY<sup>2</sup> (New Turkish Liras) 0,40 per liter is paid to producers selling milk and related products to processing industries that meet certain requirements, such as the UHT system, and double-walled boiler; and TRY 0,80 per liter if they are members of the breeders unions (using pedigree animals). The total amount of milk incentive premiums paid to producers was TL 62,252 billion during 1998-02 (ANONYMOUS 2006).

### 3.2 Empirical part of the study and findings from survey

Structural supply model of milk is containing regression with two equations where the total production and milk yield per cow are dependent variables. YAVUZ et al. (2003) stated that the first equation have three variables as total production, milk price, milk yield

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<sup>2</sup> The official name of the currency is "New Turkish Lira". It was introduced on 1 January 2005, replacing the previous lira (which remained valid in circulation until the end of 2005) at a rate of 1 new lira = 1,000,000 old lira (<http://www.tcmb.gov.tr/yeni/eng/>).

per head, fodder price and dummy variables. Dummy variable in the first equation is defined as the livestock development policies and milk incentive premium. In the second equation, milk yield per head is explained by the proportion of culture cow and cross-breed cow to total cow and dummy variables which represent cow import. It is determined from the models that two equations are identified spuriously according to order and rank conditions of equations. Each defined regression equations are estimated by using ordinary least squares three stage regression equation. Included variables in the milk supply model and estimated results are explained at below (Table 1). It is found that dummy variables represent milk incentive premium and livestock development policies are effective positively. Also, milk incentive premium and livestock development policies increase the total amount of production as 350 ton every year under ceteris paribus condition.

Table 1: OLS Regression estimation for milk supply response model in Turkey

U1=	-3073.70	+7.16v1**	+10.01sf**	-6.11yf**	350.11d1**	R2=0.99
		(30.18)	(3.81)	(-3.37)	(2.95)	
V1 =	464.47	+17.27ko**	+154.69d2			R2=0.90
		(7.74)	(1.62)			

Notes: \*\* Significant at 99 %. T statistics are given in parenthesis. R<sup>2</sup>=0.97.

U<sub>1</sub>: total production (tons); V<sub>1</sub>: yield per cow (kg/per head)

sf: milk price (t-2) (TL/kg, 1987=100); ko: culture and cross-breed cow/ total cattle (%)

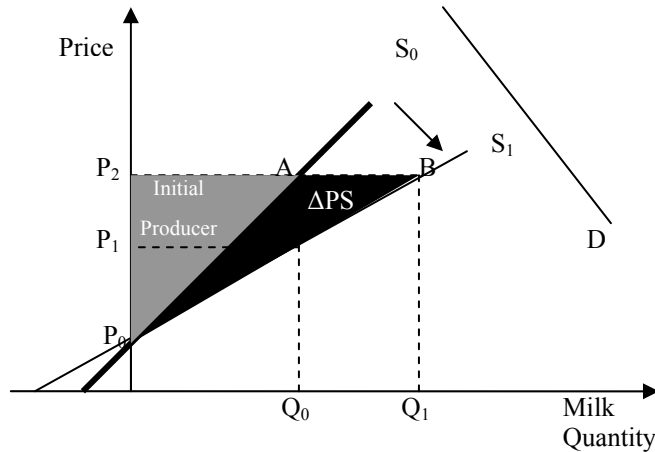
yf: fodder price (kg/TL, 1987=100); d1: culture cow import (dummy); d2: milk incentive premium (dummy)

Source: Yavuz et al. (2003).

Therefore, it could be concluded from the historical milk incentive premium data, milk incentive premium increase the total milk production average 6,652 ton since the year 1987. It is estimated that milk incentive premium have made impact in terms of economic surplus as 1.13 million \$.

The visual explanation of milk price premium support and generated economic surplus has presented graphically (Figure 2). According to this figure, milk premium has impact only on milk supply. Initially, produce surplus was the area AP2P0 and then after milk premium producer surplus increase to ABP0 area and at last producer surplus realize until BP2P0 area. Due to it is not possible to change domestic market milk prices by milk premium, there is no any affect on milk demand. Consumers do not gain economic surplus because they pay the same price or milk due to milk incentive premium does not affect the market price. The change in economic surplus accrues to producers only sell more goods at the same price and cost-saving from supply shift leads to increased revenues. Even tough Turkey import less quantity of milk and milk products so that milk supply increments with milk premium have no significant affect on domestic market milk prices. It has planned with milk incentive premium that more production with less cost (Figure 2).

**Figure 2: Economic impact from milk premium subsidy at an importer country**



Source: Based on survey results data

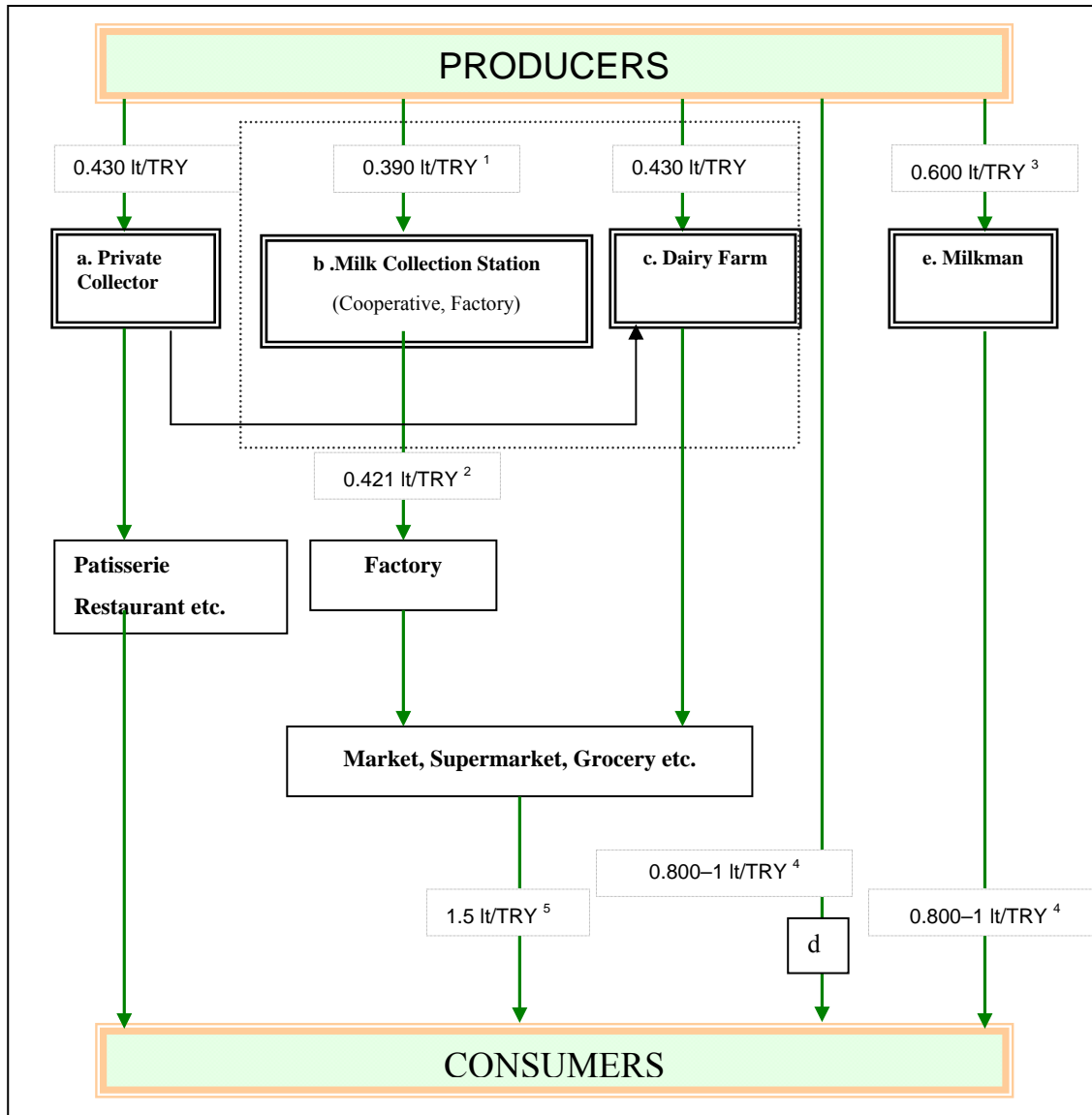
On the other hand, producer surplus depend on supply price elasticity, changes in production, producer prices and premium price. It is aimed to measure policy that is milk premium price payments affect on society (especially welfare for producers). According to KOC AND TAN (2000), calculated the milk supply elasticity 1.18 which addresses the increasing of milk prices will increase the milk supply on positive way.

### 3.2.1 Milk Marketing Channel and Price Formation in Research Area

Milk producer relies on mainly four marketing channels in Antalya. Findings from the survey result pointed out that farmers may sell milk via “milk collection stations” which may belong to cooperative or factory (Figure 2:b) but sometimes private collector distribute milk to any enterprise (Figure 2:a). Even though, stations give low prices, many producers prefer them because these producers want to take materials such as fodder, forage, veterinary services etc. in addition receive milk incentive premium. Also some of them believe in cooperatives for being more competitive during the price decision durations. The other option is selling milk directly to consumer (Figure 2:d). This way is also chosen due to difficulties to bring the local markets and offer unpacked to consumer. There are milkmen who collect milk and sell the city with less price comparing to unpacked milk prices but more price to producer (Figure 2:e).

Price is the key factor for producers for selling decision. Milk incentive premium role is supposed to producer giving up selling individual milkman switching selling decision to milk collection station as modern enterprises.

Figure 2: Milk marketing channel and price in Antalya



- <sup>1</sup> Average milk price for producer from entire milk stations (exchange rate is TRY 1= 1.23 \$) (TRY 0.390= 2.4 cent)
- <sup>2</sup> Average milk prices for producer from process plants
- <sup>3</sup> Average milk prices from milkman to producers
- <sup>4</sup> Average milk prices from milkman to consumers
- <sup>5</sup> Average retail milk prices



## 4 CONCLUSION

Livestock policies have been supported according to cyclical economic needs. These supports are arranged and implemented according to legislative documents. It is combined with the organizational structure and marketing functions of agricultural and farming organizations. There are many cooperatives and unions involved in milk and dairy products and all kinds of milk and relevant policies. Premium payments are provided directly to producers once per production period if milk distribution has realized via modern enterprises.

In the research area, some producers prefer selling milk without processing due to price incentive factors especially who reside near the city center. Price is the key factor for producer to choose the milk distribution way. Comparing milk incentive premium with producer milk prices, the percentage is as small as % 0.45 of producer price. On the other hand, milkmen who sell unpacked milk without registration give TRY 0.800-0.950 but they don't receive milk incentive premium. Therefore, premium doesn't give changes on producers' attitudes.

As GÜNEŞ 1985 mentioned that the marketing of agricultural products should be operated in an efficient way, so that, it can return a reasonable profit to the producers and so that they can continue important agricultural activities. If producers are convinced to sell milk to "milk collection stations", premium would implement more effectively by increasing the amount.

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