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Resource efficient and high value goat cheese production in Turkey

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Abstract. The value chain of dairy goat production and processing in Turkey is in sharp contrast to the market dominant dairy cow value chain. The industry is small and reliant on niche markets, requiring innovation and entrepreneurship. Economies of scale tend to downplay the efficiency of smallholdings, neglecting the environmental and social aspects of sustainability. The study aimed to show that by supporting innovation, commercialization and integration, the small goat dairy value-added chain can be a productive system across the rigid domestic dairy industry. A centralized breeder farm and a small dairy factory was formed in a rural area near Gaziantep, Turkey with aid of a university team. Twenty productive local Damascus dairy goats were bred and distributed to 12 surrounding farms on a microcredit system. Rather than the typical adopted Fernier or Artisanal method of cheese production, a cooperative structure eliminating the middleman was set up as a more productive alternative, including a small dairy factory as one of the members. The unique regional cheese was marketed as a more natural farm style brand to its equivalent sold in supermarkets. The profits were shared by members after paying for the initial animal purchase, mating, veterinary, and production services. The project showed how value was added successfully along the supply chain by collaboration between farmers, a small regional dairy factory and a university team to train and facilitate the program.

Keywords. Dairy value chain – Goat milk – Marketing-sustainability.

Production de fromage de chèvre de façon efficiente en ressources et de haute valeur en Turquie

Résumé. La chaîne de valeur de la production et transformation pour les chèvres laitières en Turquie contraste fortement avec la chaîne de valeur pour les vaches laitières, qui est dominante sur les marchés. Il s'agit d'une petite industrie qui repose sur les marchés de niche, exigeant innovation et esprit d'entreprise. Les économies d'échelle vont à l'encontre de l'efficience des petites exploitations, et négligent les aspects environnementaux et sociaux de durabilité. Cette étude visait à montrer qu'en soutenant l'innovation, la commercialisation et l'intégration, la petite chaîne des produits laitiers caprins à valeur ajoutée pouvait constituer un système productif dans le cadre d'une rigide industrie laitière nationale. Une ferme reproductrice centralisée et une petite laiterie ont été mises en place dans une zone rurale près de Gaziantep, Turquie, avec l'aide d'une équipe universitaire. On a obtenu 20 chèvres laitières de la race productive locale Damascus qui ont été distribuées dans 12 fermes des environs selon un système de microcrédit. Au lieu d'utiliser la méthode Fermière ou Artisanale généralement adoptée pour la production de fromage, on a mis en place une structure coopérative éliminant les intermédiaires, comme alternative plus intéressante, en incluant une petite laiterie parmi les membres. Ce fromage régional unique a été commercialisé sous un style de marque évoquant une ferme plus naturelle que son équivalent vendu en supermarchés. Les bénéfices ont été partagés entre les membres après déduction de l'achat initial d'animaux, de la reproduction, des services de vétérinaire et de production. Le projet a montré de quelle manière on ajoutait avec succès de la valeur tout au long de la chaîne d'approvisionnement à travers la collaboration entre des éleveurs, une petite laiterie régionale et une équipe universitaire pour la formation et la facilitation du programme.

Mots-clés. Chaîne de valeur des produits laitiers – Lait de chèvre – Marketing – Durabilité.

I – Introduction

Dairy goats account for about 2% of the world total amount of milk produced by livestock species (FAOSTAT, 2008). However, more people drink milk from goats than milk of any other animal species worldwide (Campbell and Marshall, 1975; Haenlein, 1981). Goat milk is vitally important in underdeveloped countries because it provides basic nutrition and subsistence to the majority of their populations in rural areas (Solaiman, 2010). The contribution of goat milk and dairy goat products to the economy of Mediterranean and Middle Eastern countries is especially important, as it is in many other countries worldwide (Table 1). Goat milk products are also becoming quite valued in most of the developed countries due to its perceived greater health benefits compared to the more highly consumed cows milk. As such, goat cheeses and yogurts are a highly prized commodity in gourmet outlets and classy restaurants. In marked contrast it is also the most consumed cheese in the poorest of rural communities as well, due to the versatility of the animal. In nomadic and transhumant societies cows being a far more difficult creature to handle in mountainous or desert areas, goats milk and its products are an important daily food sources of protein, phosphate, and calcium for people of underdeveloped countries (Park and Haenlein, 2006).

Table 1. Main goat milk producing countries[†] worldwide

	Goat milk total 1000 MT/year	Goat milk part of all milk, %	Goat milk/ goat/year, kg	Goat population 1,000 head ^{††}
India	3,128	4	25	124,500
Bangladesh	1,328	55	38	34,500
Sudan	1,151	16	28	40,000
Pakistan	818	4	15	52,800
France	480	2	397	1,210
Greece	460	26	87	5,300
Iran	398	24	15	26,000
Somalia	390	51	30	12,700
Spain	350	7	115	3,050
Turkey	225	3	32	7,000
Indonesia	200	29	15	13,280
Mali	196	43	17	11,460
Algeria	155	13	48	3,200
Italy	140	1	102	1,375
North ^{†††} Mediterranean	1840	1-26	140	13,090
South ^{††††} Mediterranean	618	1-14	26	23,540
World	12,455	2	16	767,930

Source: Park & Haenlein, 2006.

[†] Countries with more than 140,000 MT annual goat milk production.

^{††} Includes all goats, not just those for dairy purposes.

^{†††} Includes (1,000 head): Portugal (550), Spain (3,050), France (1,210), Italy (1,330), former Yugoslavia (350), Romania (680), Macedonia (20), Bulgaria (900), Greece (5,000).

^{††††} Includes (1,000 head): Turkey (7,000), Syria (1,000), Lebanon (380), Israel (65), Jordan (550), Egypt (3,470), Libya (1,265), Tunisia (1,400), Algeria (3,200), Morocco (5,210).

Turkey has the highest goat population in Europe (South Mediterranean) with 7 million head, however the population has been decreasing consistently since 1985 when number was 13.3 million (Guney and Ocak, 2013). Goats being a far more resilient animal than cows, Turkish villages have opted to raise goats for their dairy needs. There is increasing interest in creating direct marketing of value-added products such as artisanal farmhouse cheeses, yogurt, kefir from goat and sheep milk (Boylan, 1989; Lu, 1987; Mills, 1989; Sahlu, 1999; Thomas and Rowe, 1998).

II – Market advantage of the small enterprise

Government backed incentives for big business to invest in the livestock sector of Turkey has had disappointing results. Substantial subsidies and other similar initiatives to have large farming systems to pave the way for sustainable agricultural development has failed miserably in attempting to create widespread rural employment, despite the economies of scale argument. Such investments have mainly benefited the few that needed the least support and has had a worsening effect on the environment despite the recent tightening of the environmental protection laws. Small farms, as well as micro-sized agro-food businesses, have an important role to play in supporting the local economy and food security in rural areas where they are often placed, in contrast with the perceived benefits of large farm structures. Whilst seemingly less efficient, the small labour inclusive family farm unit, with its diverse mixed production systems often turn out to be more sustainable. We took lessons learned in Europe where the more visionary entrepreneurs have realised the limitations of large enterprises in providing long-term sustainable answers to development of animal production systems. Small to medium enterprises (SME) are proving to be the solution and have already began to take a growing share in the agro-food market. Our pilot project in Turkey has shown the ability of the small farms to maintain a more diverse mixed production system, together with the efficiency of the family labour unit is a more productive enterprise especially if the distance to the urban supply chain is kept to a minimum. In Turkey this is proving to be a successful initiative where the urban consumer is now choosing to take a slightly longer path to the marketplace appreciating the fact that the market garden on the urban fringe is often a healthier alternative to the sterile urban shopping mall which attains its produce from a more intensive large scale production system.

III – Production system used

Two hundreds and forty high yielding does from a quality breeder were bought and distributed to 12 farmers in a small village in South Eastern part of Turkey. As each family couldn't afford to pay for 20 does at one time, microfinance was arranged for the families where repayments were planned from their milk / cheese sale income. A single veterinary officer provided both animal health and AI services to all the farmers making the process far more economical. Animals were generally grazed but some degree of supplementary feed was required especially during the cooler months, which the families produced jointly near the village. The dairy requirements of each family were met by 2-3 of their goats and the milk from the other animals were either collected in the artisanal manner and made into cheese or in a couple of instances the "Fermier method" was used. Fermier method is where an individual farmer manufactures the cheese on-site using traditional methods and unpasteurised milk. All milk must come from animals raised on that farmer's farm. Artisanal method is where a single manufacturer uses their own or purchases milk from another farm to make cheese, a Cooperative is where a group of local dairy farmers pool their milk to make a cheese as part of a collective and finally Industrial production is where an industrial process is used to make cheese on a large scale. As a member of the newly formed cooperative, one of the farmers who had a small dairy factory / cheese making facility able to cope with milk from about 250 animals, was contracted and paid a separate processing fee to make the traditional local cheese. The village families in that area have been manufacturing the unique goat cheese on their farms for numerous generations. The cheese manufacturer can easily be any of the local farmers or their family who has the knowhow and skills to produce the local type cheese. The main aim in using this type of production system for this study was to encourage reduction in energy use and environmental impact of livestock production systems and at the same time creating a "shared value" small farm model, which benefits all stakeholders in the agrifood value chain. This helps the socio-economic development of the rural region by not only maintaining employment on the farm but also encouraging investment.

IV – Results

The cheese was marketed under the village brand and was sold mainly to urban dwellers who gladly traveled out to the countryside and purchased what they felt was a far more natural and healthier produce option. The cheese was definitely fresher than their industrial counterparts and at a price cheaper than what they would be paid at the local grocer or the supermarket. If the farmer were to sell the milk to the factory in the city they would have received far less returns per head of production mainly due to penalized rates for picking up small quantities of milk. Below is a simple table showing the comparative returns from value adding to the milk by selling their village brand of cheese at the rural point of processing as opposed to supplying just milk to the regional factory for cheese or ice cream. In the first instance the profits are shared at the end of the supply chain after the value has been added to the milk by producing their own brand of cheese where as the profits are far more limited when just the milk as raw material is sold at the beginning of the supply chain.

Table 2. Comparative returns[†] by value adding

Total price paid for 20 does	Period taken to repay the loan	Annual Supp. Feed Vet. & AI cost for 20 goats	Annual returns from 20 goats if milk is sold for ice cream	Annual returns from 20 goats if milk is made into village brand of cheese
3,400 Euro	9 ^{††} months	4,280 Euro	8,200 Euro	14,800 Euro

[†] Calculations shown as average gross returns from 12 farms.

^{††} Funds were paid back incrementally at 30% of the farmers income.

V – Conclusion

The project as well as reducing energy use and environmental impacts of goat milk production has helped the socio-economic development of the rural region by value adding to the production stage of the supply chain. Often the farmer just needs that support in resource management skills to improve their profit margin. This is where the regional universities can play an integral role in training to improve their entrepreneurial skills of local farmers.

The factors that made this enterprise profitable were;

- optimizing the supply of quality (productive) genetic material from a single breeder;
- providing a more cost effective centralized veterinary and AI service to all the farmers;
- efficiency of the small family labour unit;
- better natural resource management in reducing feed costs by providing quality extensive feed due to size of a manageable herd;
- forming a market edge by promoting a greener product;
- resource consolidation in the cheese production; and
- creating a market niche by merging sufficient micro producers to establish a small enterprise.

In addition to improved economic return to the farmer, other benefits the study showed were:

- multi-stakeholder partnerships to meet common objectives, including teaching institutions like universities to provide applied training in value chain diversification and product marketing;
- SME's to invest in farmer cooperatives;
- meeting market produce needs profitably whilst reducing the environmental impact of agriculture by adopting proven ecologically sound principles in small production systems.

- the model motivates SME's to foster stronger ties with local producers, suppliers and communities creating more favorable conditions for business by giving them a long-term competitive advantage.

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