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Sector Study and Value chain analysis of the Dairy sector in Syria

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Acronyms and Abbreviations

Ayran	Drink made from diluted laban and salt.
CBS	Central Bureau of Statistics.
Defra	Department of Environment Food and Rural Affairs.
EU	European Union.
FAO	Food and Agriculture Organization.
GDP	Gross Domestic Product
GEF	General Establishment for Feed.
GECTP	General Establishment for Cattle trade and production.
GOFI	General Organization for food Industries.
HALLAB	Person in charge of collecting raw milk from dairy farmers and distributing it on the market.
ITC	International Trade Center
MAAR	Ministry of Agriculture and agrarian reform
NAPC	National Agricultural Policy Center.
Laban	Set yoghurt Middle Eastern style.
Labneh	Concentrated yoghurt with salt
MET	Ministry of Economy and Trade.
SEBC	Syrian enterprise Business center
SMP	Skim Milk Powder
SNF	Solids Non-Fat in Milk.
SYP	Syrian Pound.
UK	United Kingdom
Warshe	Small processing unit in the dairy industry.
WMP	Whole milk powder.

Executive Summary

Milk constitutes the main element of the dairy sector. Its production, collection, processing and marketing form the main components of the value chain. The sector combines the agricultural and Agro-food industrial sector in Syria; two important and major sectors contributing largely to the GDP.

Milk production is directly related to Syrian livestock which include mainly milking cattle, sheep and goat. The quantity of livestock is on a regular increase and with it the production of milk. (Illustrated in table 1 and charts 1, 2, 3 & 4 of the report.); the consumption of milk is also increasing at regular pace, however it is still following a certain pattern of consumer habits. The present report aims at highlighting the components of the value chain and focusing on the items that have a direct effect on the competitiveness.

Milk production in Syria faces some constraints; Dairy cattle farms are scattered in small and micro units (starting from 2 cows) all around the country with a low productivity and an average nutritive quality (section 3.3). Only the State and joint farms in addition to some newly established privately owned pilot farms, produce acceptable quality milk, but altogether will not amount to more than 10-15% of the total milk production in Syria.

Sheep and Goat milk are produced in the grazing areas in rural Damascus but mainly around the remote areas of the Syrian Badieh and the Eastern cities. Considering its distance from the main consumption centers, over 50% of the production is transformed on site into milk products such as cheese and yoghurt.

The actual situation of the dairy farms is naturally accompanied by two major constraints; the collection and quality of milk. In the absence of a sufficient number of well equipped collection centers, around 80-90% of the milk produced is collected via middle traders called HALLAB who have gained leverage with the small farmers and use somehow primitive and insanitary means for the storage and transportation of the milk.

The hallab at present dominate the milk supply in Syria. The majority is limited to collecting and selling their raw product either directly to consumers or to small and medium production units called Warshe. Some of them have even extended their business and opened their own Warshe. With the exception of a few, most of the Hallab resort to milk adulteration in order to hide the defects of their products which were either undetected from the source or has deteriorated during the transportation cycle, especially in summer. This of course has resulted in reducing the quality of the dairy products in Syria, and reduced the prices to a level which became practically impossible to compete with, using good standard quality practices.

Another important factor affecting the dairy sector is the cost of production of cow milk; the major apparent parameter affecting the cost is the price of feed. This latter is a critical ingredient in the development of milking cattle and in normal cases constitute between 65 and 70% of the cost of milk, all other conditions being equal; in other words cattle productivity and milk quality. Syria being a local producer of feed, sometimes resorts to the import of feed if the quantities locally produced is not sufficient. Considering the low productivity of the Syrian livestock and the low limit prices of milk, any abrupt fluctuation in the prices of feed automatically leads to disruption in the feasibility of the farms. An

improvement in the productivity and the quality of milk will no doubt provide some immunity to the dairy farmers in times of crisis.

Having said this, the price of milk depends on the cost of milk, but even more on supply and demand, milk quality, distance from the source, and the International price of milk powder.

The price of milk reached a first time level since decades as a result of international price increase of all commodities and fuel; this of course initiated a disaster in the sector at the beginning, which upon stabilizing turned out to be a first time relief to the farmers as their milk was sold at bargain prices. Prices are falling again. The level at which prices will settle in the near future, will determine the development of the sector on the short term basis.

The processing of milk in Syria could be a stabilizing element in the value chain for its ability to dilute some of the costs issues within a larger value addition; in the actual situation Milk processing is divided into three segments. The first segment is the consumer himself who buys or even produces¹ his own ration of raw milk on a daily or weekly basis and transforms it at home into milk products mainly Laban, Labneh and some specialty cheeses. This segment does not contribute significant value addition.

The second segment is the Hallab or the Warshe, who has duplicated the home system into a larger setting capable of absorbing the surplus production of milk from the farmers during the high season and transform it into Syrian specialty white cheeses such as 'shilal", 'Halloum", "Akawi", "majdoule", "baladieh" and so on. The units are characterized by a lack of good milk production practices and a low standard of sanitation and hygiene. This segment constitutes today 85 to 90% of the processed market in Syria. It has some positive contribution to the value chain but is affecting negatively the image of the dairy sector in Syria as well as it's the proper development.

The third segment are the Dairies, both public and private, which rely on mass production technology, and which respect to a certain extent the rules of industrial production, product standards and good manufacturing practices. In normal situation they should dominate the market in view of the economy of scale advantage; nevertheless they barely cover 10 to 15% of the market. The main reason is their inability to compete with the cost structure of the Warshe, and with the unfair competition of the informal market. In that respect they have opted to produce items that the warshe cannot produce such as yellow cheese, processed cheese, UHT drinking milk, and bottled milk packed in individual packs and labeled and well branded. Most dairies at present are complaining, justly, of insufficient gross margins to cover their costs and their development.

The Dairy market in Syria is highly unstructured as a result of the presence of a powerful informal market. No one can put an exact figure but probably over 50% of the milk and milk products produced and sold are sub-standard and are beyond any significant control other than the trust bond that exists between the consumer and his Hallab, and the consumer and his grocery. Groceries represent in Syria the largest outlet segment. (Table 9, chart10)The market is slowly shifting towards branded items, but it is not certain whether this shift will continue in the dairy sector or will be inhibited by the consumption habits and the low purchasing power of the consumer. (Complete formal value chain is mapped in section 7)

A value chain mapping (sections 7& 8) show the complex diversification of the dairy market; three different channels each having its own mind. This does not apply to other food

¹ Rural areas.

sectors. The determination of the value additions per category is also complex as formal market producers have to comply with the market rules imposed by the informal market as well as the Warshe producers who in many cases are also direct sellers. In other words it is the product price prevailing on the market, which determines the marketing and sales policy of large producers and on which they have little influence.

Exporting dairy product seems to be a flourishing business in Syria at a yearly growth of 50 % (table 10, chart 11). The market price advantage of Syrian milk compared to its neighboring countries could be the reason for this growth; this is backed up by the fact that exported products are mainly intermediate processed non-branded items, rather than high value added branded products. This of course creates a price sensitive export market, not adapted to the Syrian market with its low price elasticity. The trend should be to upgrade branded products and implement new marketing strategies; nevertheless if the local market does not become more structured, it is likely that the export market will also follow the trend.

The adequate development of the dairy sector in Syria can be highly accelerated if the influence of the informal sector is reduced through government intervention and through applying the rules set by the government. The liberalization of the sector after decades of directed economy is not sufficient to promote the sector without the indirect support of the public sector; especially at the level of optimizing the farms, improving the breed, educating the farmers on farm management, motivating investors to establish farms in favorable areas, reduce the risk of farmers through insurances or guarantee schemes, protect grazing land as sheep and goat represent a wealth that could be highly exploited at the level of exports, push towards organizing the dairy market through a better application of the rules and quality standards, and through the more stringent control on sub-standard product and production. It is not by suppressing the role of the warshe or hallab but by organizing it in a way that allows fair commercial practices on the local market and a safe finished product to the consumer. Finally the private sector also has an important role to play through smart investments in farm and in production, taking in consideration optimal conditions for both operations. Invest in the development of new products customized to regional markets; focus on the quality and lobby in order to penetrate markets with which Syria has bilateral agreements.

1. Introduction

Milk, which constitutes the main agricultural commodity for the dairy sector, is a bulky (87% water), heavy and highly perishable item if not immediately cooled or stored properly; its **production, processing and marketing** join two major economical sectors in Syria: The animal production Agricultural sector and the Agro-food industrial sector. The two sectors together represent over 30% of the National GDP and directly or indirectly provide employment to millions of Syrians.

1.1 The Syrian livestock sector:

The livestock referred to in this report are Cows, Sheep and Goat. There was a significant growth in the livestock population between 2001 and 2006. The highest enhancement was attained by cattle population. Sheep growth rates were also significant, but mainly comply with foreign demand on live sheep meat.² The livestock population is shared by Public, private and cooperatives. The cooperatives sector dominates sheep and goat breeding.

The development of the livestock productivity is mainly attributed to government intervention in terms of providing improved cattle, sheep and goat races, livestock services and feed mixes. Government intervention however is being gradually reduced to lead the way to private sector initiatives.

1.2 The Syrian Agro-food sector:

It has evolved in the recent years to become the sector with the highest value added margin surpassing other important sectors such as textile and garment sector; it represents over 33% of the industrial manufacturing value.³

Unlike the other agricultural commodities such as cereal grains, the dairy sub-sector is minimally controlled by the state and can be considered as one of the mostly liberalized sectors in the Syrian economy. Having said this it is still considered as an emerging sector, and as a consequence it is highly affected by external parameters such as international market trends, local supply and demand, seasonal and climatic conditions, farm productivity and animal yield, cost of fodder, cost of fuel, and the development of value added products.

The processing of milk products is of primary importance viewing the fact that the milk is a highly perishable item and therefore its processing does not merely increase its commercial shelf life, but also creates value addition which could reach as high as 150% in some items. Recent studies on the comparative advantage of industrial sectors in Syria have shown that the Dairy sector is one of the most promising sectors.⁴

The gradual shift of the Syrian economy to an open market economy, regionally and internationally and with the EU-Syrian Association Agreement coming into force, in addition to the already active Arab market agreement, Syrian products will have the opportunity to penetrate new and rich markets; provided of course that they are competitive in price as much as in quality.

As far as dairy products are concerned the challenge is even bigger. FAO reports classify the global dairy sector as one of the most distorted agricultural sectors in the sense that it is

² The state of agriculture in Syria 2007.FAO/NAPC.

³ Extracted from the "profile of the Agro-food sector in Syria" prepared by SEBC team, In March 2003.

⁴ Review of Syria's economic sector. (Owen and Arbache.2006).

highly influenced by government subsidies, tariff protection tariffs, unfair competition to a level that small and poor countries are having difficulties developing their dairy sectors because of cheap subsidized milk is flooding their markets.⁵ Considering all of the above, it is safe enough to assume that the door to a successful export market for milk and milk products is a healthy and well structured local market.

1.3 Background information.

The following assignment has been triggered by challenges emerging as a result of the gradual shift of the Syrian economy to an open market economy. One of those challenges is the coming in to force of the EU-Syrian Association Agreement, whereby Syrian markets will be opened to European products, and consequently Syrian products will be exposed to severe competition; at the same time, creating export opportunities for Syrian manufacturers in the wider EU markets. Having said this, the efficiency of the economical sectors and the major players in those sectors, namely SMEs becomes a crucial factor in addressing those challenges.

The Syrian government's policy to foster and develop the Agro-Food sector in Syria, has also led to organizations such as SEBC/SSP to put emphasis on providing assistance to industrial sectors that have shown high growth during the recent period; the Dairy sector is seen as one of those sectors.

The dairy sector in Syria is diverse and traditional and enjoys a very good reputation for quality & good taste within the home market. Furthermore, Syria presents significant opportunities to foreign countries interested in technology and knowledge transfers relating to the dairy sector.

A relatively small proportion of dairy cattle milk in Syria is processed by modern processing plants into treated dairy products packed in bottles, cartons or pouches. A portion of informal cattle milk, and most sheep milk, processing takes place at the site of production. It is usually transformed by traditional ways into yoghurt, and cheese, which are then sold in city streets by the farmers themselves or through vendors without any effective state control.

Given the importance of promoting and maximizing income from supplemental agricultural activities and generating employment in rural areas by raising awareness and achieving greater market presence for local agricultural products, developing a proper policy for the dairy in Syria followed by an effective action plan, would be an important step to maximize benefits from this sector.

2. Objectives of the Assignment

This report has been prepared with the funding of the European Union and assistance of the Syrian enterprise business center (SEBC) under the supervision Mr. Paul Goodegard and direct assistance of Miss Maya Al Ramli as the project coordinator.

The main objective of the mission is to prepare an overview on the Syrian dairy sector while reviewing competitiveness and performing a value chain analysis. The results of the assignment shall be reflected in a Swot Analysis and recommendations for the development of the sector.

⁵FAO: Developing countries and the global dairy sector. Vivien Knips

2.1 The report provides an overview on the following components:

- Production of Fresh Milk in Syria, its collection and the main parameters affecting its cost, its price and its quality.
- Processing of Fresh Milk into milk products including flow charts of the major items produced; impact of imported SMP and WMP.
- Marketing, sales and distribution of the milk and milk products. Flow chart of the value chain
- Regulatory and quality management aspects.
- Benchmark with some regional countries and international trade.
- SWOT Analysis on the Dairy sector.
- Conclusion and recommendations.

2.2 The Methodology

The first phase of the project consists of collecting statistics and obtaining feedback from major public sector institutions, such as the Ministries of Agriculture and of Industry. Market information is scarce. The specificity of the Dairy sector is that it is highly unstructured and diversified with the result that even government statistics are not very precise. The general approach was based on the following methodology;

- Reports and Data available at Syrian government and donor projects, were reviewed; such studies pertaining to the FAO, MAAR, NAPC, ECD, SEBC,
- Meetings with representatives of government institutions in Damascus, Aleppo and Hama and HOMS, such as the ministry of agriculture, ministry of Industry, General establishment for food industries(GOFI), General establishment for livestock(GEF), Ministry of economy and trade(MOET), NAPC, CBS,
- Meetings with economical institutions such as the Chambers of Industry and Agriculture of Damascus, Aleppo, Hama and Homs.
- Meetings with public and private dairy industrial stakeholders were held in Damascus, Aleppo, Hama and Homs.
- Market visits were conducted in some groceries in Damascus, Aleppo, and Homs.

3. Fresh Milk Production in Syria.

The dairy sector begins with milk production; it is the first link in the value chain and the item which impacts the other components in a significant manner.

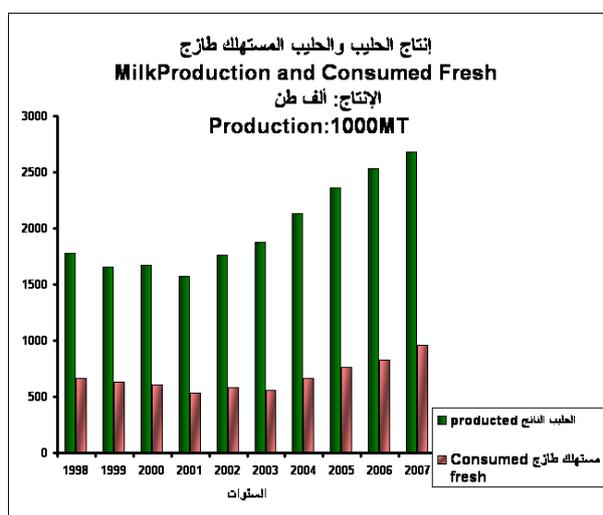
The bulk of milk production in Syria comes from Cow, followed by some significant quantities of Sheep milk and goat milk. Cow milk is produced from livestock raised in small farms or in public farms which partly is destined for meat and partly for milk. The cow milk production has been in constant increase since 2002 at a rate of 100,000 liters a year. Table 1 provides figures of yearly milk production.

Table1⁶: Fresh Milk production per type of milk during the last five years (000MT). $\Delta P = \%$ Increment Increase.

Type of milk	2002	2003	2004	2005	2006	2007	ΔP
Cow milk	1,170,000	1,207,000	1,364,000	1,500,000	1,600,000	1,700,000	45%
Sheep milk	536,000	596,000	690,000	765,000	824,000	873,000	62.8%
Goat Milk	56,000	71,000	72,000	81,000	91,000	97,000	73%
Total Milk	1,762,000	1,874,000	2,126,000	2,346,000	2,515,000	2,670,000	

The milk consumption followed the increase in production or vice versa. It is shown on the following chart.

Chart1: Fresh Milk production and Consumption. (Courtesy MAAR)



Courtesy of MAAR and NAPC.

The daily milk consumption calculated as milk produced (minus milk consumed for animal sustainability which is about 10%) over Population number was in 2007 /2008 In the vicinity of 120liters per capita excluding Whole Milk powder and infant milk powder. Even if the official figures are not very accurate, the consumption per capita of fresh milk (in different forms) can be considered as high in comparison to other developing countries (average 50 liters/capita). Note that in developed European countries the figure can double, however powder milk is not frequently utilized.

⁶Extracted from MAAR statistics for 2007.

Table 2⁷: Milking Livestock (heads): by type; by variety; by milk production & average yield 2003/2005/2007(MT/Year).

Type and Variety	2003			2005			2007		
	Qty	Milk	Yield	Qty	Milk	Yield	Qty	Milk	Yield
Local cattle	72172	37102	514	33172	37493	1130	42751	33535	785
Shami cattle	2505	5585	2230	2070	3287	1588	877	1986	2264
Improved cattle	358815	959944	2675	463265	1255478	2710	547207	1447935	2646
Foreign cattle	48130	204485	4249	51645	209251	4051	54604	222402	4072
Total Sheep	10090000	596000	59	13019000	765851	59	15700000	873000	55
Total Goat	698864	71100	101	880945	81169	100	1064000	96967	91

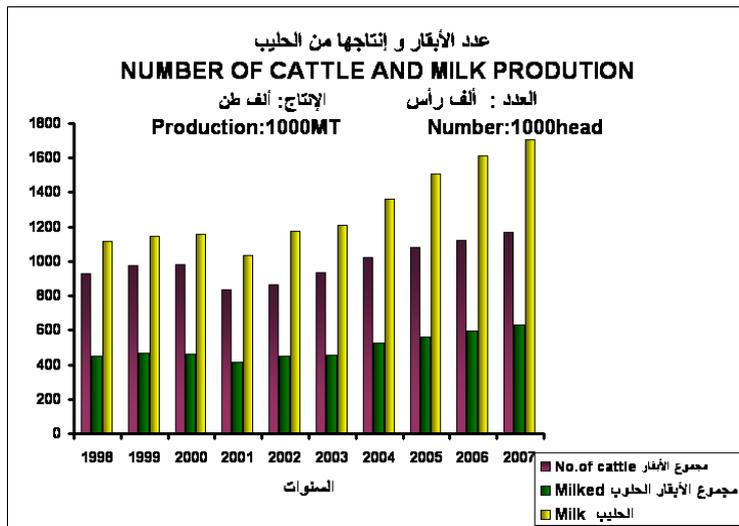
Table 2 clearly shows that the number of cattle, sheep and goats is steadily increasing to cope with the milk production, nevertheless the productivity is constant. It also shows that the difference in productivity between different varieties is very significant.

The productivity of sheep and goats is naturally lower than cow especially that the seasons are much shorter; nevertheless sheep and goats in Europe and New Zealand are known to provide higher yields.

Charts 2, 3 and 4, illustrate the variation between the number of heads and milk productivity for the past ten years. The productivity is slightly fluctuating, even though we can safely say that it has been relatively stable. It also clearly illustrates that “Shami” cows that are appreciated in Syria for the good quality of their milk and its resistance to diseases, is being reduced in quantity for the last ten years in an alarming manner.

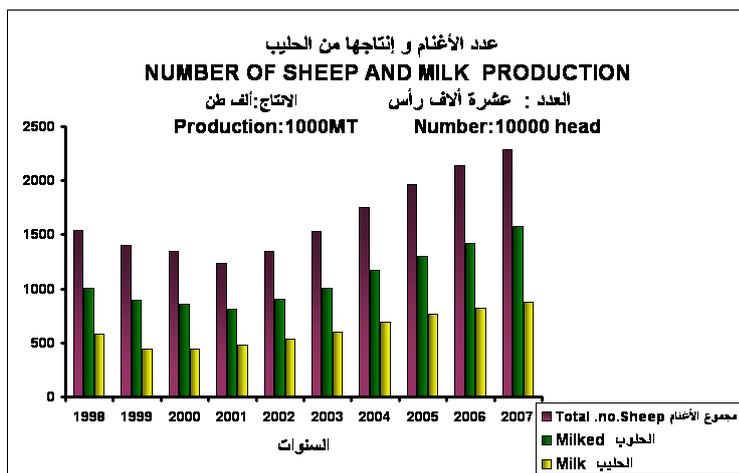
⁷ Extracted from MAAR statistics 2007. The yield has been calculated.

Chart2: Cattle heads vs. milk production over 10 years.



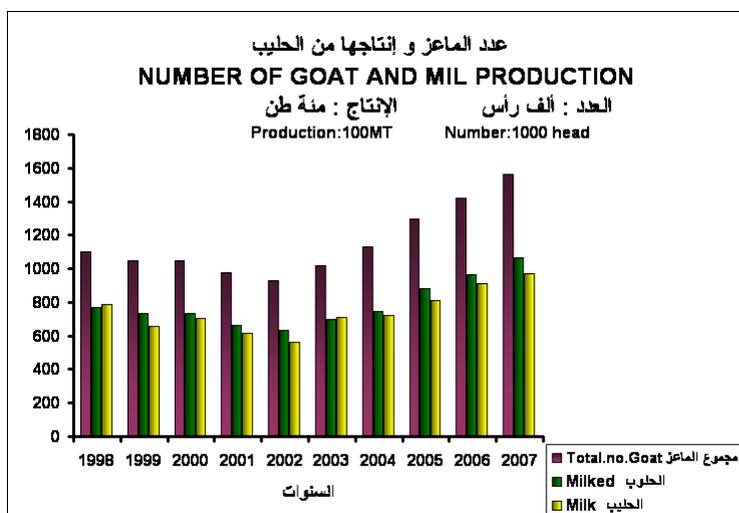
Courtesy of MAAR & NAPC

Chart 3: Sheep vs. Milk production over 10 years.



Courtesy of MAAR & NAPC

Chart 4: Goat vs. Milk production over 10 years.



Courtesy of MAAR & NAPC.

3.1 Milk Sources

Cow milk is produced in closed farms of different sizes and categories; in order to be able to understand the milk production situation, it is important to have a general idea as to the different farm systems available in Syria today and what are their respective properties.

Small and Micro Farms: The most numerous farms in Syria, which usually consist of 1 or 2 cows (Hiyazeh) up till 40 cows. Raising cows for most of these farms is a marginal business. They mostly consider it as supplementary income to their crop production or a business that provides house work for their family. (The wife, brother, or children). As a result of this situation the management of those farms does not follow standard farm management procedures; costs considered are mainly cost of feed to animals and veterinary costs. Everything else, such as labor cost energy and depreciation, is considered as in-house services. The majority of such farms comply with the following characteristics:

- They are managed by the family members.
- The cows are of different varieties, mainly local or improved.
- They rely on external veterinary services and on government support in that aspect.
- They usually rely on manual milking of the cows, and in the case of larger farms they use individual milking machines.
- They are characterized by lack of hygiene and sanitation.
- They do not test their milk except possibly for acidity and density.
- Their clients are generally the Hallab as their ability to store milk more than the same day is almost nil

Public Farms:

There are about 15 of those farms distributed among the Syrian mohafazat. They have been designed as state of the art farms since a long time and are still considered by processors as suppliers of highly reliable milk. They mostly depend financially on government support. Since 1987 the government's open policy requested that all public institution follow free market strategies and become self sustainable. This of course could not take place overnight and as a consequence public farm managers were completely focused on sustainability rather than improvement or modernization. The characteristics of those farms are as follows:

- ✓ Most of the cattle were of Friesian origin or improved hence can obtain a relatively average milk yield if compared with international standards.
- ✓ The milking systems are automated nevertheless have become old and obsolete.
- ✓ They have milk storage tanks sufficient to store their milk production for 48 hours at low temperatures.
- ✓ They have excellent veterinary support.
- ✓ In 2008 they have produced around 27,000 MT of milk, which constitutes about 3% of the total cow milk production in Syria.
- ✓ Their preferred clients are Milk processors, as they can absorb large quantities of milk and own refrigerated milk transport trucks.

- ✓ They are usually overstaffed but have sufficient qualified personnel.
- ✓ They apply standard farm management where all costs are accounted for and recorded, for the final cost of the milk.
- ✓ They possess surplus land surrounding their farms, which makes it easier for developing own feed.

Joint Farms:

Two farms are still in operation. The “joint farms” are joint ventures between Syria and another country, such as the Syrian/Libyan Company, and Syrian Saudi Company. Those farms have been designed to provide significant quantities of Milk and have been equipped with good quality machinery at the time. The present condition of the Syrian/Libyan farm for instance, is characterized by a need for reconditioning of the building as well as the equipment. The quality of the herd however is still good and the milk yield is among the highest in Syria.

- ✓ The number of cows varies between 600 and 800 heads; they are known to sell farmers young heifers so that they can maintain their productivity.
- ✓ They are mechanized but not highly automated.
- ✓ The level of Hygiene is acceptable.
- ✓ They have own veterinary services.
- ✓ They have own feed formulation services.
- ✓ They usually are linked to own processing unit.
- ✓ Surplus milk is sold to milk processors.
- ✓ The Farms applies standard farm management and costing.

Private Pilot Farms

They are privately owned farms, of small to medium size (Between 100 to 200 heads of cattle), usually located in lands in the rural areas near the cities. Their number varies between 8 and 12, mostly recently established, run by owners and a limited number of qualified personnel. They have been labeled as pilot considering that they are the first privately owned farms that have been created since years. Major characteristics:

- ✓ Depend on high productivity cows.
- ✓ Use own artificial insemination techniques to preserve Breed.
- ✓ Depend on mechanization for feeding, milking and feed arrangement, even if sometimes not very modern.
- ✓ Keep good records.
- ✓ Not completely autonomous, usually rely on external veterinary support plus government free services.
- ✓ Apply good farm management practices.
- ✓ Are aware of sanitation and hygiene practices. Produce good quality milk in terms of nutrient content as well as apply relatively high production yields.
- ✓ Some of them are linked with processing units but, the majority is not.

Sheep and Goat Milk:

Even though the number of sheep and goats is increasing year after year, their surface area for natural grazing is decreasing at an alarming rate. The main reasons being the urban development around the cities, such as Damascus and Aleppo, and the climatic effects such as the drought seasons that has been hitting the country in the past years. The grazing crops or green fodder area has decreased by 20% if we compare the 4 years (2002-2006) to its previous 4 years (1997-2001)⁸. This phenomenon also means that sheep and goats which were mainly concentrated in the Eastern and south Eastern part of Syria are gradually migrating to the rain fed western parts.

Sheep and Goat are mainly raised in flocks of hundreds and sometimes thousands by BEDOUIN farmers. During the last 2 years a huge number of heads were sold as meat as a result of the flourishing trade of "AWASSI" sheep to countries such AS Saudi Arabia.

Goat is being mainly raised for its meat and is not encouraged by government due to its "harmful" effect to the forests.⁹

3.2 Collection of fresh Milk

Cow Milk produced has to be made available for consumption or for processing; considering the diversity and number of small farms, their remoteness from point of consumption or sales, the condition of the agricultural roads and the sensitivity of milk to heat and ambient temperature, Collection of milk is the second item of the value chain; it is also a critical item in determining availability of good quality milk to consumer as well as to processing units.¹⁰

Considering that the majority of farms are small independent family farms with daily productions that could be as small as 50 liters a day, milk collection becomes a costly and cumbersome issue facing the dairy sector in Syria.

Adequate logistics and roads are not always easily accessible, especially in the rural areas, where farmers are located and where animals are raised.

99% of the small farms do not have refrigerated storage facilities for the milk they produce; therefore milk has to be collected twice a day, especially in summer; adding to the cost of collection. Furthermore the high climatic temperatures in summer increase the deterioration rate of milk and hence collection becomes more risky without the use of refrigerated trucks. How does it work?

Small farmers depend on the "Hallab", or "Jabbane" to collect their milk twice a day; the name implies the person who milks the cows or who produces the cheese; in reality it is merely a milk collector and transporter. Each Hallab has a number of farmers or clients from whom he collects milk. He also negotiates the prices with farmers. Some hallab work independently and other are part of the "Association of fellaheen"; a kind of organized syndicate for milk collectors. The role of the association is not very clear. Their role is to pass on government support to farmers such as feed rations, veterinary support and artificial insemination, in return for getting milk.

⁸ FAO/NAPC: State of the Agriculture 2007 edition.

⁹ Forest protection rules have inhibited goat grazing in some areas due to their eating habits,

¹⁰ A main reason for Milk quality deterioration is the bad conditions in which hallab collect milk; and the lack of adequate storage facilities in micro and small farms.

The Hallab has some stronger leverage on the milk producers. He performs two very important functions:

1- Removes the milk from the farmer before it ruins.¹¹

2- Provides loans to farmers for feed supply and other farm management requirements.

It is common practice to mix milk obtained from different farmers and of different quality into one aluminum bin or plastic drum. The idea is to produce an average quality. It is not possible or the Hallab to control the quality of each amount of milk he buys; his inspection tools are visual or olfactory. Some more important Hallab uses density meters and tests acidity, only to be able to evaluate the overall condition of the milk obtained, and to possibly think of potential remedies. For that purpose Hallab are associated with adulteration of milk. This makes them a suspicious supplier to industries or large cheese producers.

More sophisticated "hallab" transport the milk in stainless steel tanks mounted on a Suzuki truck. In best cases the tanks are insulated. This will keep the milk cool if it has been refrigerated initially.

A more efficient and rational remedy is to establish a collection centre at a reasonable distance from the sources of supply; the centre should be equipped with refrigerated tanks and should have an inspection service. In areas where milk is abundant and as a result of a more exigent clientele, several hallab have opted for this solution. The benefits of such a solution are evident:

- Better microbial quality.
- Lower logistic costs.
- Longer lead time for delivery.
- Obtain better prices.

As a result the number of such collection centers is increasing and their quality improving.

In general the "Hallab" adds about 1SYP to 2 SYP (US\$0.02-0.04) per kg of milk¹². This service includes the following activities:

- Collection of milk.
- Visual inspection.
- Transportation to site. (Processing unit or grocery).
- Services to the Farmer.
- In case a collection centre is involved another 0.5 -0.75 SYP (US\$ 0.01-0.015) are added to the value.

State farms and Joint farms follow a different path. The farms are equipped with their own refrigerated collection or storage facilities which can vary from 5 MT till 30 MT depending on the farm. This capacity is usually sufficient for 48 hours. Therefore the farms should be able to sell their product before that period. They are highly solicited by processing dairies

¹¹ Small farmers are completely dependent on Hallab for selling their milk; usually they are bound by pre-commitments..

¹² Value obtained from discussions with Hallab in Damascus area and Factory managers.

and therefore it is possible for them to sell 1SYP to 2 SYP more expensive than small farmers. State owned farms do not possess transportation facilities; they deliver the milk directly to mobile collection tanks owned by factories or a big Hallab owning a collection center not very far from the farm.

The private farms are also equipped with storage facilities; smaller than those of state farms but proportional to their daily production which at present does not exceed 2 – 3 MT per day. The collection here is done through Approved Hallab¹³, or by using own transportation vehicles or delivering from farm door to those factories possessing their own storage vehicles. Here also price ex-farm can increase between 1 -2 Sp per kg compared to small farmers¹⁴. The final quality of the milk however usually compensates the price.

Sheep Fresh MILK collection differs from fresh Cow milk collection. Sheep is raised in flocks that travel from area to area¹⁵ looking for available grazing land. They are characterized by Bedouin shepherds or Arabs¹⁶ as they are sometimes called. This situation makes fresh milk collection a hideous task. Nevertheless some Hallab and even producers go to remote areas¹⁷ to collect the milk from those farmers. It should also be noted that the productivity of the sheep is much lower than that of a cow. About 60 Kg/year or per season compared to about 2500 kg/year up to 6000 Kg per year for cows. This small production is slightly balanced by the larger number of sheep heads. Still this low productivity does not enhance the collection process with the result that many Bedouins transform their milk into specialty cheeses or yoghurt to provide them with more time to sell their products. The sheep owners or farmers have tendency to adhere to local cooperatives (72% of all sheep heads)¹⁸ that protect their interests. In view of the facts that the facility of collecting Sheep milk and of marketing it is a complex operation if it is to be performed by individual shepherd or sheep owners, adhering to such Coops seems to be a natural outcome.

3.3 Quality of Milk and milk product.

3.3a. the quality parameters:

Milk quality can be described using several parameters; some of those parameters are innate to milk and can be caused by the very nature of milk itself; such as:

- Extent of Milk deterioration: in other words the natural deterioration of milk reflected in an increase in the acidity caused by the fermentation of the milk and the increase in the microbial load and the nature of those Micro-organisms. The usual acceptable acidity ranges from 14% till 20%. Processing companies have noted frequent offered raw milk having lower levels and surprisingly enough higher levels as a result of respectively bad storage or adulteration.

¹³ Approved in the sense that, the Hallab has gained the trust of the farmers and is adequately equipped for transporting their milk.

¹⁴ The milk of Private farms is selected by factories even if at a premium because it is more consistent in quality.

¹⁵ Two main reasons: 1-seasonal related to climate and 2- Looking for water.

¹⁶ Arab here means Arab Bedouins living in the Badiéh (Syrian Steppe), considering that the vast majority of Syrians are Arabs.

¹⁷ Due to an increasing demand for sheep milk, some producers organize collection vehicles to remote areas in order to satisfy their requirements for sheep milk before it is transformed by the farmers into other products.

¹⁸ Based on the Syrian Central Bureau of Statistics (CBS).

- The natural nutritive quality of the milk; in terms of Fat content, protein content and total solids.

Other parameters are induced; in other words adulterated. Such as:

- Addition of water.
- Addition of peroxides to reduce microbial load.
- Addition of thickening agents such as starch to increase viscosity or density.
- Addition of alkaline ingredients in order to reduce acidity.
- Addition of salt to increase the total solids.
- Addition of Titanium dioxide to increase the whiteness of the milk.

All the above adulterations are illegal and prohibited by law. Yet they are widely applied in the Syrian Dairy sector, especially at the level of the Fresh milk sales by the local Hallab.

It is the habit of local consumers to boil the milk before using it; most probably as a result of previous bad experience.

- A third parameter which is partly a result of fraud and/or ignorance is the production of sub-standards milk products non-complying with the government standards or norms.¹⁹

The Syrian government has established a set of norms pertaining to milk production and packaging. Those standards address issues such as microbial criteria, minimum solid content, and use of powder milk in some products, addition of vegetable fats and so on. Those criteria whether chemical or biological constitute the acceptable quality limits that all players in the dairy sector should abide with, irrespective of the fact whether those criteria are realistic or not in the context of the Syrian market. Looking at some market inspection records available at the technical department of the ministry of economy, indicate that there is regularly a presence of sub-standard products on the commercial market in Syria is positive and in proportions that differ from region to region in Syria.²⁰

The seriousness of the facts is obvious considering that those issues are directly related to the health of the Syrian consumer, to a situation of unfair competition with respect to the other players on the ground and to Fraud against Syrian regulations. The persistence of such a situation is without doubt an important drawback for the re-structuring of the Dairy sector in Syria.

3.3b the chemical and nutrient quality of the Syrian milk:

According to the Syrian Norm 194 /2001 for whole raw cow milk, the minimal Fat content shall be 3.3% and the minimal total SNF content shall be 8.25%. Acidity to be maximum 18% as lactic acid, and not less than 14%. It was not possible to obtain any official results on the average nutrient situation of Syrian Milk. The indications during the brief study were that the majority of the fresh milk produced revolves around those minimal figures. As a matter of fact very few of the farms and companies visited actually measure the composition of

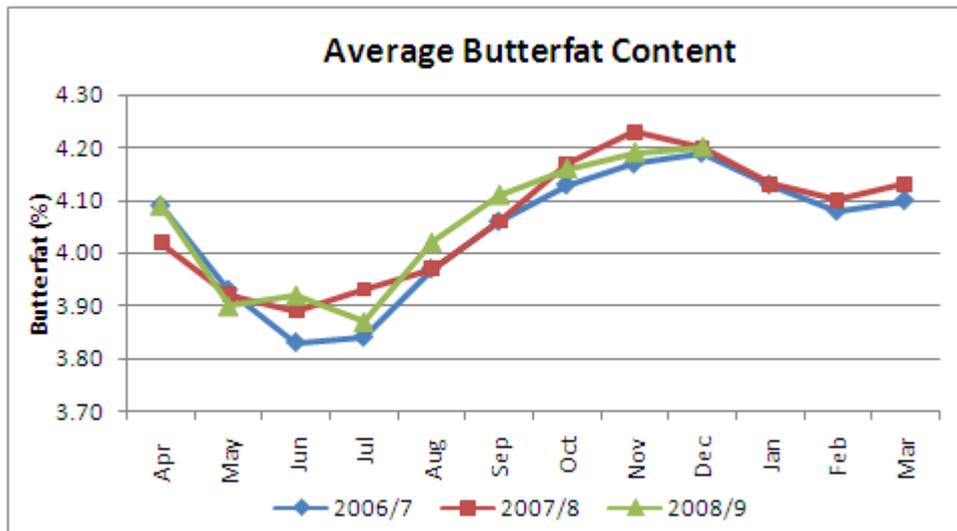
¹⁹ There exists in Syria about 22 standards related to milk and milk products.

²⁰ Quarterly inspection reports are filed at the ministry of economy on a large list of consumer items including dairy products.

milk. They merely focus on acidity and fat Content. Some companies have given ranges from 2.9 till 3.5%fat content; the acidity varied from 14 till 20%.

Comparing milk quality with data obtained from European sources, shows that average Fat content ranges between 3.84 until 4.09 depending on the years. The following chart no. 5 shows the average fat composition of milk in the UK over 3 years. This gives an indication as to the potential continual performance that could be obtained on a large sample of cows. Comparing Syrian milk to regional countries such as Turkey, Lebanon and even Jordan would not show such a discrepancy, and hence should not be taken as a target sample.

Chart 5²¹: Average Butterfat content UK last three years.



3.3c The Microbial quality of Syrian Milk:

Syrian Norms 2179/2007 related to Microbial criteria requires that Raw Milk does not exceed a maximum 1,000,000 while the average per samples should be around 100,000 colonies/ml. Milk should also be empty from any pathogenic organisms. Indications from most sources visited that this is not the case. Bacterial count upon milk reception exceeds 1million most of the time, with some possibility that it contain Brucellae or Mastitis or other pathogens. Hence the habit of Syrian consumers to boil fresh milk upon its purchase and to distrust local processing. Comparing to UK sampling, and testing using a Bactoscan²², a maximum figure obtained during the last three years for milk was 210,000 cells per ml.

Upgrading the quality of milk in Syria will need to address several issues:

- Animal Varieties.
- Animal veterinary care.
- Milk handling and transportation.

²¹ Sources Defra UK.

²² A Bactoscan is an analytical tool capable of assessing a large number of milk samples for microbial counts in at the same time and in a quick time.

3.4 Cost of milk

3.41 Cost components

In order to be able to calculate added value all through the value chain, it is imperative to determine the cost of fresh milk, and analyze what the different parameters that are affecting it. Milk is produced at the farm, which automatically implies different costs according to the type of farm as detailed in section 3.1. Theoretically this should not be the case. Milk production is affected by three types of costs: Direct costs, which do not differ much from farm to farm. Indirect costs which are related to volume and depreciation; and cost of money. Finally remains costs pertaining to the lack of efficiency and performance.

The typical direct costs of fresh milk production for a small to medium farm in Syria comply with the following structure:

Table3: Cost component for the production of cow milk in percentage.

Cost Component*	%
Feed	70%
labor	6%
Veterinary services	5%
Land rent/cost	10%
Miscellaneous including energy	2%

* Estimates obtained from mission interviews.

The above costs are direct costs related to farm management. They do not include cost of herd replacement as a result of death sickness and lack of productivity (Could reach up to 25% of total herd), cost of milk and feed provided for sustainability of young heifers during the period of their growth (can cost up to 10-12% of milk produced) and cows during the mating period. It also does not include the cost compensation resulting from the birth of new calves, the sales of young calves for meat, selling of animal hide or animal manure.

Indirect costs are related to economy of scale; all factors equal, a larger farm should be able to cost less than a smaller one per head. In Syria the largest farms are the state farms, followed by the state/joint farms; even though state farms are relatively performing, they still cannot be used as reference farms in terms of cost. They usually are overstaffed, and they have been allocated with a financial burden which has accumulated over the years.

Pilot private farms should be used as an example but most of these farms are still small (100-200 heads) and their owners too prudent to venture into enlarging their size, especially after the difficult 2007/2008 year where the price of feed was at its highest peak ever.

Costs due to lack of performance, are in reality relative costs; it is the costs incurred by farmers whose yield of milk per head is lower than average whose feed management is not optimized and whose veterinary care is not adequate.

As a case study, a more complete cost structure for fresh milk was provided by the Chamber of Agriculture of HOMS for 2008. It is based on an average value. It could be summarized as follows:

Table 4: An example of a milk cost sheet per cow (HOMS chamber of agriculture).

Cost component per head	Value in SYP	Percentage
Depreciations (including cow estimated at 6 years)	10768	14.8%
Manual labor (Based on 1 worker for 9 cows)	14000	19.4%
Cost of feed. (Based on a mixture of high protein feed, green fodder, high fiber feed)+ salts	40732	57%
Cost of water and electricity	372	0.5%
Cost of veterinary services and medicine	4080	5.5%
Death and emergency sickness	1400	2%
Miscellaneous	650	0.8%
Total costs	71912	100%
Income component per head		
Value of new born calve	7200	
Value of manure and hide	1250	
Value of meat	5000	
Total income	13450	
NET EXPENSES(Costs –income)	58462	
Average Milk yield per cow/per year in KG	4200	
Average Cost Per 1 Kg of Milk	13.92	

If we compare the average factory door price of milk in the same period and in the same region which could be estimated to about SYP19; then income generated to the farm during that period was SYP 5 /Kg or 36% of the cost. The gross margins are feasible, indicating that the above cost is quite an optimistic evaluation.

Analysis of the cost sheet: Applying the above cost sheet to available national statistical figures of 2007/2008, we arrive to a less optimistic situation.

- Feed Concentrate is at SYP 13.8/Kg and not 8.5 as calculated in the above sheet (probably subsidized), which should bring the cost of feed per year to about SYP 54000 (instead of the SP 41,000. used in the above study)
- The Average milk national yield in Syria, taking in consideration all cow varieties, is about 2700 k/year instead of the 4200kg yearly yield as mentioned in the study.
- The replacement cost of a cow today is over SYP 100,000 meaning that based on depreciation over 6 years; the yearly cost should be about SYP 17,000 instead of SYP 9600 as calculated in the above sheet.

Therefore the new cost per kg of milk should be as follows:

Net cost 71462/2700 milk yield per year= 26.4.meaning a significant loss compared to the ex-farm sales price of SYP19. This second situation identifies with a large segment of the cattle business and more with what is happening in the dairy sector

The importance of this exercise is to show the sensitive impact of the price of feed the feed mix and the cow yield on the profitability of the farms; this explains why many farmers during 2008 were obliged to sell some of their livestock to sustain their business and why new investments in farms are somehow slow.

3.42 Parameters for Competitiveness of the cost of Cow milk:

The two major cost parameters that could be influenced are:

1- The milk yield.

2- Cost of Feed.

1-The lactation period of a cow is considered to be 305 days; theoretically it is during those days that the Cow produces milk; therefore milk yield can be indicated per lactation or per year (365 days). The first calculation provides real daily productivity while the second provides realistic costing considering that during its non-productive days the cow is still an expense. For the sake of the report we will indicate milk yield by year.

In order to be able to benchmark the competitiveness, we have extracted some information related to cow and sheep milk yields in other countries. Hereafter is the table showing different milk productivity

Table 5: Milk productivity

Cow milk	Syria (Kg of milk)	Jordan (Kg of milk)	Turkey (Kg of milk)	Egypt (Kg of milk)	Saudi Arabia (Kg of milk)
Average yield per/cow/ year 2005 ²³	2535	4850	2300	NA	8800
Average Yield per cow/year /2007	2700 ²⁴	NA	NA	7100 ²⁵	NA
Sheep Milk	Syria (Kg of milk)	Turkey (Kg of milk)	France (Kg of milk)		
Average yield/head/year 2007	55 ²⁶	78 ²⁷	250		

²³ Obtained from the Danish Dairy Board Statistics.

²⁴ Obtained from MAAR statistics.

²⁵ Obtained from Egyptian sources in the dairy sector.

²⁶ MAAR Statistics.

²⁷ Study on the overview on the Turkish Dairy sector.

The above figures are obtained by dividing the total milk production per year by the number of available milking cows. This reflects a real average, but hides an important factor which is the high or low yields attained by certain farms or more precisely certain cow varieties.

If we consider information obtained from some selected farms in Syria we can obtain different figures:

State Farms in 2008: Average productivity is 5116 Kg.

Syrian/Libyan farm 2008: Average productivity is about 5800 kg/cow/year.

Private owned farm 2008 (Haffar): 6400kg of milk per year.

(Considering that the average UK Milk yield for 2007/8 was 6900liters/cow/year)²⁸

The positive conclusion behind the above figures:

- The possibility of increasing the yield is real and is being applied in some farms in Syria.
- The factor reducing the average yield is the low productivity of local cows and shami cows and the productivity of improved cows which is higher however not sufficiently high. The possibility of improvement is also real.

The negative aspect is that the productive cows represent only 8-10% of the milking cows, and therefore there is a huge step to undertake if we are to reach a high productivity similar to that in Saudi Arabia, Europe or even Jordan.

2- The impact of feed on the productivity of the cows and consequently of the cost of the milk has also two faces:

- The supply of the right type of feed from the local market.
- The management of feed formulation and ingestion which can affect the quantity of feed administered per cow as well as the nutrient content of this feed and its impact on high quality milk production during the whole life cycle of the cow.

The mix usually utilized in SYRIA is the following:

- Concentrate made from high energy and high protein sources (Soya meals, corn, and wheat). Usually imported but could be produced locally.
- Green fodder. (Local supply)

The ratio utilized by farmers differs a lot; it varies from a 20:80 to an 80:20. In general a high concentrate is recommended for barn cows; however it should be managed all through the lactation period as productivity varies. The idea is to have maximal yield, maximal milk quality and optimal utilization of feed. It is obvious that the education of the farmer has an important effect on the yield. A simple relation between Feed and milk is the dry matter content of feed; dry matter content, which is determined by feed rations, it influences the quality and the yield of milk and its nutrient content.

²⁸ Defra UK.

Recommendations:

- Renewal of the cow breeds is an essential element for increasing the national average milk yield; consequently the nutritive quality might be improved and the milk cost automatically reduced. It has been proven that the pure Friesian and Holstein cows have produced better yields by far than the local breeds and significantly better than the improved breeds.
- Increasing the number of collection centers, especially in the rural areas where milk is produced in large amounts and where logistics are difficult, will no doubt facilitate the collection of milk, upgrade its quality by retarding its deterioration and reduce its cost by reducing the costs of logistics; it will also permit the screening of low quality milk and apply a payment scheme related to quality; this will motivate farmers to invest on their quality.
- Provide intensive training in farm management especially in the tasks related to veterinary services and feed formulation and rationing. This knowledge transfer will no doubt induce a significant performance improvement among farmers.
- Encouraging the establishment of medium sized farms in favorable areas where land is relatively cheap and where water is available and consequently green fodder. The control of the farm size is important in several aspects:
 - It improves the cost through a more favorable economy of scale.
 - It will allow farmer to justify permanent farm services such as veterinary services and automated milking systems.
 - It rationalizes and facilitates the maintenance of a productive herd, by performing a periodical replacement of livestock.
- Introduce the culture of hygiene in Syrian farms; this will improve life expectancy of cows, and milk quality.

4. Price of Milk

Price of milk continuously varies in Syria as well as on an international basis. The parameters affecting the price apply in Syria, same as it applies to the rest of the world. Hence it was normal that prices of milk were very high during 2008 following the international trend. The prices of milk in 2007/2008 reached prices first time ever attained in Syria; the main reasons behind this rise is the significant increase in the cost of agricultural commodities, which directly affected the level of the cost of feed; this in addition to the increase in the cost of fuel. Those two parameters had a drastic effect on the basic cost of milk as we have seen in section 3.4.

The cost of feed concentrate in Syria reached a first time high of over SYP 23. If we Base on the feed price-milk price conversion ratio, the cost of milk should naturally be much higher. This situation of high feed prices, automatically led to small farmers reducing their herd and selling it for meat in order to survive. Fortunately for the Dairy sector this situation is changing at present and feed prices are returning to more reasonable levels.

The other factors affecting the price of milk, is the supply and demand of fresh milk in addition to the quality of milk. In this aspect the specificity of the Syrian market does not always follow international trends. A noticeable point is that the significant increase in the price of milk as a result of the international increase in prices of commodities was not followed by the same rate of decrease in the prices when those commodities went down; it could be explained by the fact that price of milk in Syria went into an adjustment phase. Milk prices which ranged between 14 and 20 SYP in mid 2006 were undervalued compared to the costs and to the prices on the international scene. In addition, the demand from the

industry, both public and private, for good quality milk of both Cow and sheep has contributed to this adjustment.

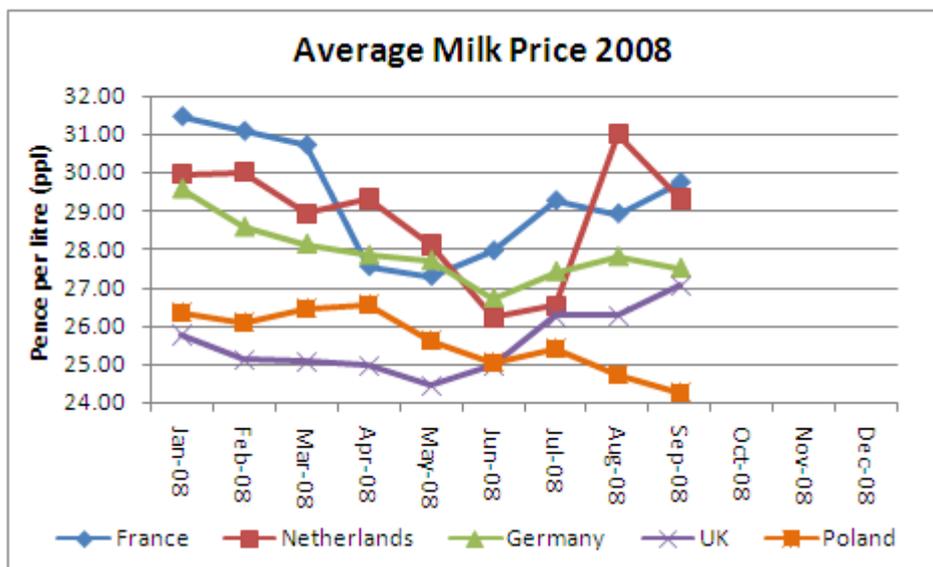
We could safely say that milk prices in Syria are starting to follow the parameters of demand and supply and of quality, even though there is not a declared system; However Milk prices are expected to get even lower in the near future, for two main reasons: Demand from external markets has slowed down due to the loss of the price advantage of the Syrian milk, and the low quality of fresh milk is pushing consumers and also many industries to rely more and more on Powder milk; both WMP and SMP. IF the Syrian milk producers want to maintain their present level of prices or remain within acceptable ranges they should immediately work on improving the quality of their milk and the productivity of their animals. Otherwise and all factors remaining the same, the powder milk market will prevail.

Prices of dairy products in Syria are theoretically monitored by the Ministry of economy. Prices are pre-set periodically whenever there is a reason to vary. Practically this is not followed on the market. The Syrian market is practically following demand and supply as far as Milk is concerned.

Price comparisons:

The Syrian market price in 2008 varied between 20 SYP and 26 SYP. (US\$ 0.42 and 0.55) depending on the region. Compared to regional prices in Lebanon the price of milk averages US\$ 0.54, in Jordan US\$ 0.5 -0.55, in Egypt. It averages to US\$0.42 .Reliable information comes from the EU Publications. The average price for milk in the EU in 2008 varied between Euro 0.31 till 0.35 (US\$0.4 till 0.4 4)²⁹.It is clear from the figures that Syrian milk is able to compete with regional milk except Egypt and cannot beat international market prices. it would be surprising to expect that with the actual state of the sector that a competitive outcome can be obtained. As a benchmark of an international price fluctuation and level the chart no.

Chart 6³⁰: average price of EU milk 2007 per selected countries.



²⁹ Based on 1euro=1.3US\$; 1US\$=47syp;1US\$=1500LP

³⁰ Source DG Agri C4

5. Milk processing

The better value addition comes from transforming Fresh milk into a milk product. In Syria milk is processed into several different categories of products the most important being Drinking milk (Pasteurized and sterilized), Yoghurt (Laban), labneh , cheeses. Other products are also obtained from milk such as butter, cream, Kashta, ghee, Ice cream. The latter products have also an important market but are not part of the complete value chain for different reasons, a major one the complete reliance on imported powder milk (Ice cream sector).

Large scale industrial processing used to be limited to the three state factories of Damascus, Aleppo, and Homs. Those factories had a capacity to produce thousands of tons of pasteurized milk, Laban, Labneh and several types of white cheeses, yellow cheeses, and processed cheese and cream cheese. Parallel to those factories emerged hundreds; and today even thousands of small production units called “Warshe”, distributed all over Syria, which produce significant amount of laban, Labneh, Ayran and white cheeses, using very modest means, and sell them to the local population around them. Those units started as farmers who wanted to obtain more money for their milk or who wanted to have their milk collected on a regular basis; upon their success they developed to become milk collectors whose task is to absorb not only their milk, but the milk production of a certain number of other small farmers around them. If the “hallab” becomes also a producer of milk products then he is also known as the “Jabbane”.

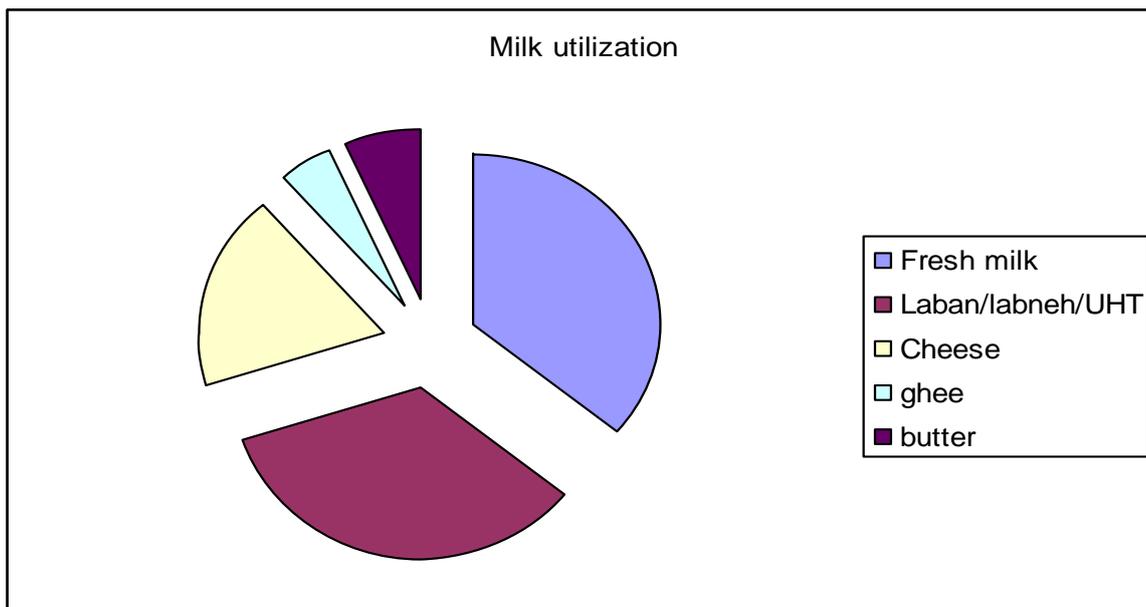
Having said this, the consumption habits of the Syrian consumer up to date is primarily focused on buying Fresh raw Milk from their local hallab, boil it at home and process it into mainly laban and labneh, and in some cases simple white cheeses or Karishe. If we consider that over 50% of the milk produced in Syria is purchased fresh and mostly processed at home, then it is natural to conclude that the first processor in Syria is the Syrian house wife, and the highest consumed milk product is Laban. Official statistics on milk utilization validate this fact.

Table 6³¹: Milk utilization for processing 2003-2007

Processed products	Metric tons		
	2003	2005	2007
Drinking milk	NA	NA	NA
Laban and Labneh	300,000	364,000	393,000
Cheese	41,000	52,000	64,000
Butter	2,400	3,400	4000
Ghee	4,600	6,500	6800

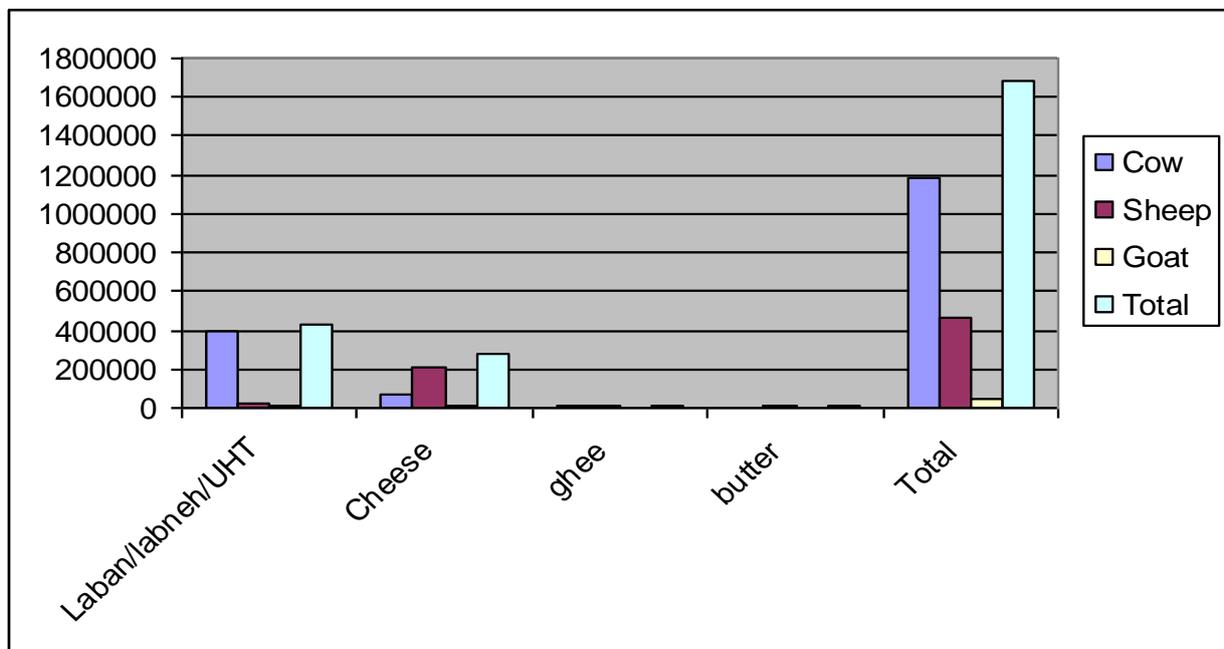
³¹ MAAR Statistics.

Chart 7: Portion of processed milk compared to milk sold as fresh produce.



The two main milk types used in processing are Cow and sheep; goat is also manufactured but in lesser amounts. Chart no. 7 gives an idea on the portion of processed dairy products produced from each type of milk as obtained from MAAR statistics. It is clear from the chart that the UHT milk, laban and labneh are mainly cow and a large portion of the cheeses are made from sheep milk. This situation is highly influenced by the fact that a large quantity of sheep milk is processed on site.

Chart 8: Milk type vs. processed Dairy products.



Milk processing then is achieved in four different channels:

- Home Made.

- Through Hallab or Jabbane.
- Through State owned dairies.
- Through Privately owned Dairies.

Despite the huge discrepancies between the structures of each of the above channels (excluding homemade) the last three channels are competing for the same market, whether formally or informally, without complying with the same rules of the game.

5.1 Hallab or Jabbane

Commercially a “Hallab” or “Jabbane” can be one of the following:

- Part of a small or medium size grocery or a Warshe.
- A non-registered small entity working without official license.

A “warshe”: is a semi processing unit, usually consisting of very basic processing equipment, most of the time with practically a low level standard of sanitation or hygiene.

Most items produced in the “warsheh” are unbranded, with a returnable package, and an inconsistent quality.

Types of products produced:

- Laban in 1, 2 and 4.5kg plastic buckets.
- Labneh in bulk.
- Fresh milk in bulk.
- Ayran.
- White cheeses such as “SHILAL”, “Baladi”, “Akawi”, “Istanbouli”, “Miyassara”, “Hallowm”, either packed in brine for long conservation or low salt in vacuum plastic bags or pouches, for immediate consumption.

In the case of sheep milk products, the “Warshe” is usually composed of the farmers themselves or their family that produce cheese and laban. In sheep grazing areas the processing of milk is hand made by the women in the family. Since quantities produced are very small, farmers try to obtain more value addition by processing the sheep or goat milk into specific types of cheese, or even yoghurt. In the strong sheep milk season in spring they produce what is known as “Laban Rabihi” which has a relatively acid taste, stores in refrigerators for months, and is sold more expensive in low seasons.

Major characteristics of a Warshe:

- ✓ Many “warshe” are not officially registered or licensed.
- ✓ They do not comply with basic rules of sanitation and hygiene in their processing systems as well as their personnel.
- ✓ They operate from unsanitary locations.
- ✓ Frequently their products are sub-standards. (Do not comply with Syrian standards).
- ✓ They use non-recommended packaging materials.
- ✓ They usually re-use same consumer package without sufficient cleaning.
- ✓ They have no means of controlling the milk they buy except visually or by simple testing equipment.

✓ Finished product usually non-branded.

5.2 Private Dairies.

Since the advent of investment law no.10 in 1991, and the laws that followed, there was a rush on the establishment of new factories in Syria. The agro-food sector took a good part in that rush. Over thirty known private dairies with available and well distributed market brands along with and tens of other factories are registered at the ministry of Industry or the chambers of Industry. Brands such as Milkman, Hana farms, Al-Halabi, Goodies, Aryaf, Kaaki, Draie, Tayba, iceman, Halibouna, Samer, Bel, , Roubana , Al shark, in addition of the brands of the state owned factories: Mimas, and AL-Ghouta. Those factories produce a large number of Dairy items such as Pasteurized milk, sterilized milk, UHT milk, Yoghurt, labneh, Traditional Syrian white cheeses, Kashkaval cheese, Mozzarella cheese, processed cheese, cream cheeses, canned Kashta, packed powder milk,.

The dairies are equipped with high output equipment, mostly imported from Europe, which has cost them millions of US dollars. Their non-declared policy is the following:

- 1- Focus on high volume products.
- 2- Introduce high value added products.
- 3- Target export markets.

Up to date most Dairies were not able to meet the needed volumes as a result of the heavy and unfair competition by the “warshe”. Many of those companies have diversified in their range of products such as producing Juices, or flavored milk, or flavored yoghurt in order to create capacity. In addition, most industries are creating own niche markets, are diversifying in products that are not produced in the “warshe” such as processed cheese, and are investing in the export markets.

5.3 Technology

The large Dairies have introduced new technologies in a very short time. They produce almost all types of Drinking milk in glass, plastic and paper. They have state of the art equipment and seem to master the knowhow.

Most of the materials used in the relevant Dairy industry are locally produced. Except, for some basic raw materials for packaging that are used in some products. The development of the technologies should follow R&D principles that are linking product development to consumer and market requirements.

The food safety and quality awareness is not always the benchmark, even among the larger factories. In many cases the technology used is based on cost consideration only.

5.4 Competitiveness

One way of evaluating the competitiveness of the Syrian processing sector, is by estimating the added value on some of the highly sold products. It is not an easy task considering that during the period of the study the price of milk was gradually being reduced following a strong upward jump, as a result of the reduction in the cost of some of the commodities as well as the price of fuel. The focus was on two types of categories: The individually packed items and the bulk items. As a general rule, individually packed items are branded and produced by the large dairies. Bulk items are generally produced by the Warshe.

Table 7³²: Prices specific to branded items

Branded		(Based on a milk price of 25 SYP/kg delivered to factories and cleaned.) ³³				
Item	Package	Brand	retail price/kg	deduced ex fact ³⁴	RM+PM	gross margins ³⁵
UHT milk	Carton	Milkman	50	40	30	0.25
Laban	Plastic	Goody Hana	50	40	30	0.25
Labneh	Plastic	Farms	137	110	86	0.21
Kashkaval (segmented)	Plastic film	Goody	351	281	253	0.10

Table 8³⁶:

Bulk		(Based on a milk price of SYP23Cow and SYP 33 for sheep milk) ³⁷		
Non branded	Price per kg	Est. ex- fact. Price	Est. Ex fact Cost	Gross Margins
Shilal cow	325	260	156.5	0.40
Shilal sheep	375	300	188.5	0.37
Halloum				
Jadal,cow	295	236	156.5	0.34
Akawi,cow	250	200	145	0.28
Laban rabihi				
Labne	120	109	67	0.38

The cost figures above have been generally estimated based on a certain price of milk during a specific period and the product flow chart. (See below) Analyzing some of the figures, namely the gross margins, it is apparent that the higher margins are obtained from cheese except for Kashkaval; which seems to be significantly low. Laban and labneh are high volume items and their margins are lower. In general the margins are considered low compared to similar industries in the regional countries. Despite the fact that in Syria

³² Retail Prices obtained from main hypermarkets Town center and Cham city market in Damascus.

³³ The price for good quality milk paid by Dairies in November and December 2008, delivered to factory.

³⁴ Estimation based on an average 25% margin of profit set by the supermarket.

³⁵ Gross margin = (Ex-factory price-Cost of RM+PM)/Cost of RM+PM

³⁶ Bulk prices sold at the main markets in Damascus and Aleppo.

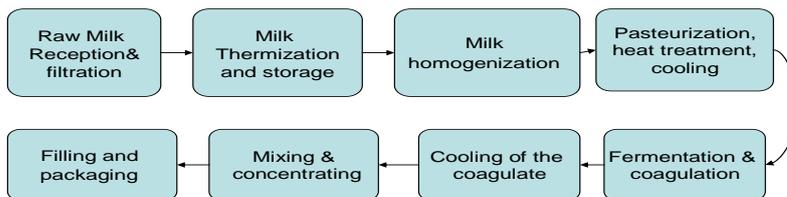
³⁷ the Price of milk obtained by Warshe during last quarter of 2008.

wages are lower and electric energy is subsidized, a margin of 20% or even 30% on cheap items such as food items cannot be considered as sufficient to sustain the industry and finance its development. Let alone if this company does not have the advantage of the economy of scale. Based on those facts it is clearer why some products are commercialized with a sub-standard quality.

Chart 9:

Processing flow chart Laban and Labneh

2.5-3kg of milk produces 1 kg of Labneh + one recipient.

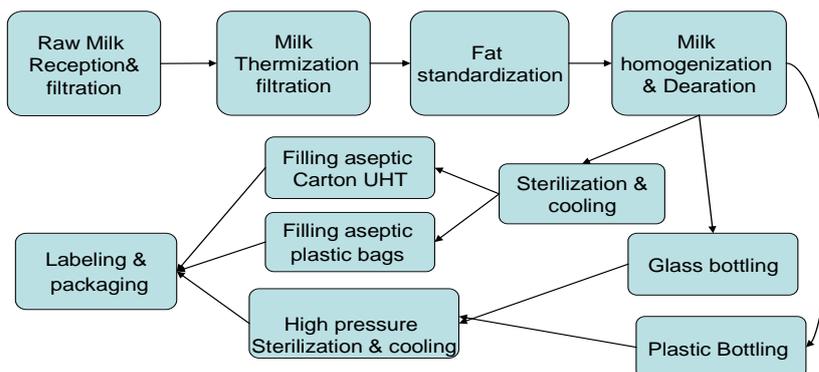


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Chart 10:

Processing flow chart Drinking milk

(pasteurized, Sterilized and UHT): 1kg of raw milk produces about 1kg of drinking milk plus packaging.



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Recommendations:

- An adequate application of the national standards and norms for milk production and milk products will render the competition between different processing entities more fair. Considering that the Syrian market is a price sensitive market, any discrepancies in the costs due to sub-standard quality will give its owner a competitive advantage, for a large segment of the consumers. The economies of scale are important parameters in the profitability of food industries particularly in the Dairies.
- Large Dairies should be able to counterpart the lower costs incurred by the small Warshe through the reduction of their overheads; this can be achieved via increased production efficiency; better procurement conditions and a good marketing mix.
- Application of smart product development. In other words develop new or innovated products based on the Syrian consumer demand and habits, and not merely on available new technology. A first step would be to provide the consumer with his actual needs in a more healthy and practical manner; always taking the final price in consideration, without making it the first priority. Example1: Produce Laban and labne the traditional way while packing it in a clean and easy to handle package. Example2: Increase the size of the package to fit family size while providing a re-closable lid, and many other ideas adapted to what the consumer perceives as good.
- Intensification of quality awareness campaigns will eventually impact the decision making of the Syrian consumer and can influence his purchase decisions. The gradual shift from unsafe products to standard compliant products will motivate producers to enhance their qualities.
- The application of quality systems and Quality assurance methodologies such as HACCP in Syrian dairies. This has a dual purpose: 1- Distinguish good dairies from non-compliant processing units, and 2- The proper development of the export markets. The industries that are mostly solicited for quality systems are the dairies, while in reality they do not fall at the top of the list if compared with other existing agro-food companies.
- The implementation of processing units nearby to milk production entities. This will reduce significantly the cost of logistics and will assure better quality milk.
- Modify the specific Syrian norms to allow the utilization of a certain percentage of milk powder in certain milk products such as drinking milk or some kind of cheeses; at present milk powder is being used, against the norms, at different levels (2-10%) to compensate for the fresh milk quality.

6. The Market

Syria's population exceeds 20,000,000 people nearing about 3, 5 million households. The largest two cities are Damascus (about 27%) and Aleppo (about 22%), followed by Homs and Hama. The Syrian consumer is a dairy consumer "par excellence". Almost in every household you can either find milk, yoghurt or cheese or a mix. From there it is possible to estimate the size of the market. The Dairy products market in Syria is however quite unstructured in many aspects. The products are sold via at least two channels: A non-formal channel and a formal channel. This is no so uncommon in countries in the region;

nevertheless the size of the informal market in Syria is quite significant and in some items such as fresh milk it is dominating.

6.1 The informal channel:

It initiates at the level of milk production; mainly cow milk. About half the fresh milk produced is being moved through hundreds of collectors from thousands of farmers in rural areas of Damascus, Aleppo, Hama, Homs, Lattaquiah, Hassakeh and Deir Ezzor to be distributed directly to the consumer or to the vendors or small groceries serving specific street areas with practically no government control.

What applies to milk, also applies to Laban, labneh and Ayrān.

Sheep and goat milk have different status; the collectors need to follow the flock to the available grazing areas; the farmers in those areas are more organized and tend to have two hats: producer and processor. Therefore cheese and other milk products tend to be the larger trading commodity.

It is difficult to evaluate the size of the informal market, but considering that milk production is highly outsourced from the small farmers and remote areas, the informal channel is still an important player and touches over half of the Syrian population. In the remote rural areas it represents a natural segment of the market, in big cities like Damascus, Aleppo, Homs, Lattatquieh, it represents a parallel market that does not obey the same market rules.

The main players are a segment of the milk collectors (Hallab), small farmers, Bedouin Women in the Badieh, some housewives selling to their neighbors.

Distribution channels: Direct distribution.

6.2 The Formal commercial market.

At this level also we also have different categories of producers or processors:

- Milk collectors with licensed processing units. (Hallab or Jabbane):
- Processing Dairies.

Both processors sell their products through different distribution channels:

- Directly to retailers or caterers.
- Through wholesalers and from them to retailers and caterers.
- Through agents distributors, from them to retailers and caterers.

The Dairy market in Syria is also divided into two distinct segments:

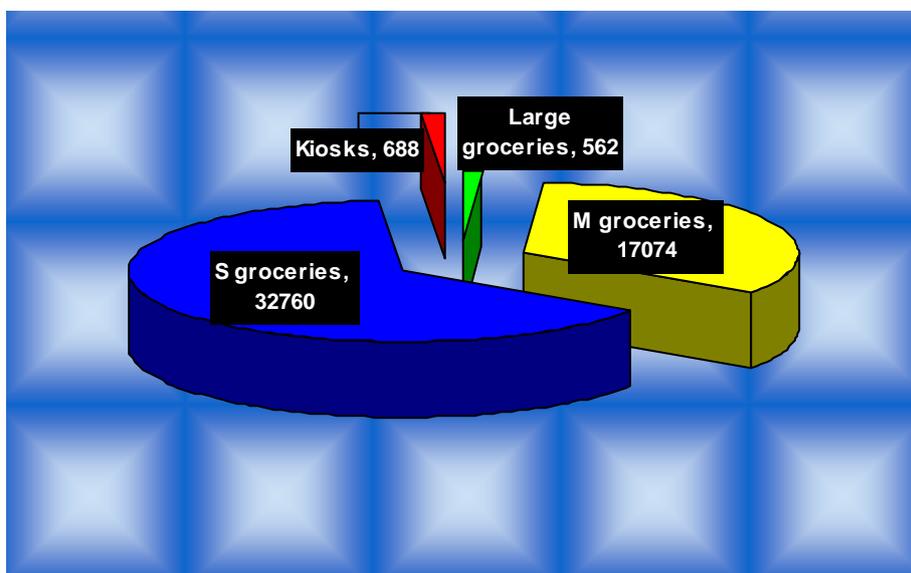
- The bulk non-branded segment which represents about 85% of the market.
- The branded (Packed and labeled) individual items.

The trade universe in Syria can practically be described in Table7, chart 7:

Table9: Syria Trade Universe.³⁸

Trade Category	Univers	HDD Weight
S Service/ L Groceries (>60	562	3%
Medium Groceries (20-60 sqm)	17,074	37%
Small Groceries (<20 sqm)	32,760	59%
Kiosks	688	1%
Grand Total	51,084	100%

Chart 11: Outlet Universe



6.3 Dairy products distribution:

The storage and transportation of Dairy products except powder milk should respect the cold chain cycle; as a result of this condition most dairies would prefer to rely on the direct distribution of their products in order to ensure quality and reduce product returns. Some factories such as the state owned or joint factories that do not have a distribution fleet rely on special qualified wholesalers to distribute their branded products.

6.4 Role of milk powder in the development of the dairy market:

The continual increase of the milk powder market share is related to different issues:

- The absence of infant milk powder locally.

³⁸ Courtesy local market survey company

- Gradual Shifting of the Syrian consumer from the informal milk market and its hygiene issues to powder; processed milk being more expensive and still under scrutiny from the consumer.
- The lower price of SMP compared to fresh Milk; recent price of SMP is equivalent to about SP120/kg which is equivalent to SYP 18 of liquid milk.
- The need of local dairies in order to standardize their own supply of fresh milk and reduce its material costs so that they can compete with informal sector and at the export level.

6.5 Foreign Trade

Figures taken from CBS sources show an apparent growth of exports of about 50%. Figures could even be larger considering that a lot of milk and cheese enter export markets such as Lebanese markets informally³⁹. Despite the growth the export quantities are considered to be relatively small, hence the description of emerging market⁴⁰.

- On the other hand Syria imports large quantities of Powder milk and some cheeses for industry and for retail. Powder milks for infants, as well a milk powder for industry is becoming more and more solicited.

Hereafter are the proportions of individual items as calculated based on 2006 figures of the CBS. (Most recent published figures).

Table 10: Major Syrian Dairy exports (2006)

Major export items by %(2006)

HS CODE	Export	% in Value
04.02	Milk or cream sweetened.	46%
04.03	Laban / Labneh	1.2%
04.02	Ice cream	6.3%
04.06	cheeses	31%

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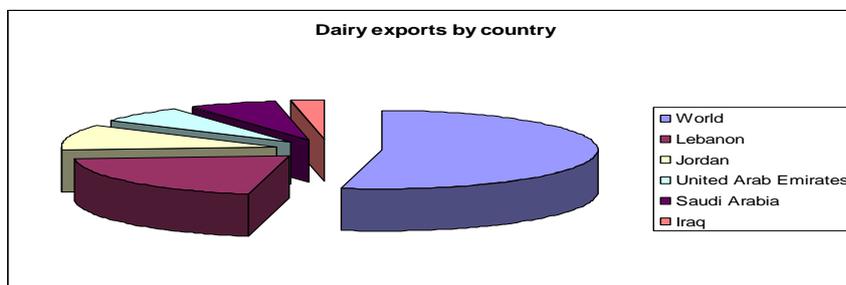
The exports are mainly exported to few regional countries, Lebanon being at the top of the list.

³⁹ Market information.

⁴⁰ Description by the ITC.

Chart 12: Syrian Exports by specific country (2006)

Distribution of dairy exports by specific country(2006)



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(2006)

Table 11: Major Dairy imports to Syria

Major Imports

HS Code	Commodity	Quantity MT	Value US\$
0402.10.10	Infant milk powder	2437	9,415,000
0402.10.20	Milk powder>2.5kg	4973	8,730,000
0402.29.20	Milk Powder for industry>2.5kg	14359	38,456,000
0405.10.10	Butter for industry	5025	9,940,000
0406.30.10	Cheddar cheese for industry	644	2,467,000
0406.90.00	Other cheeses	1919	6,046,000

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Most of the Imports are to be used as intermediary ingredients. Milk powder has a dual use. Cheddar cheese and Butter are used for industrial purposes in the production of processed cheese and of commercial butter.

Comparing regional export markets, Syria seems to be doing well compared to Turkey for example; not so well compared to Jordan which is a much smaller country. Nevertheless Jordan is also benefiting from a privileged location near the still turmoil Iraqi market.

Table 12: Comparative export value with some regional countries.

Foreign Trade

- Comparing export figures of Dairy products with neighboring countries:

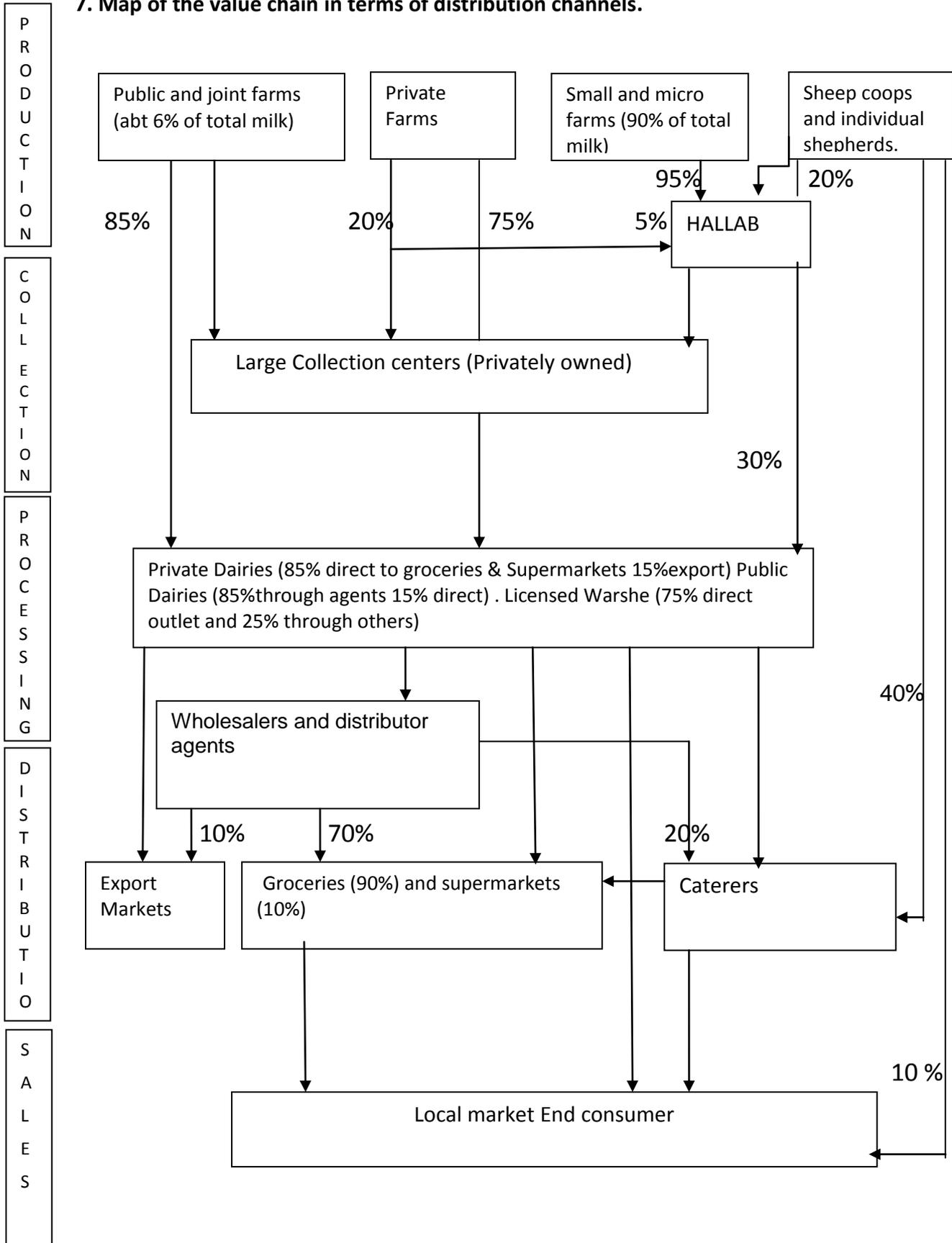
Country	Total exports(2006) US\$
Syria	124, 000,000
Jordan	63,000,000
Cyprus	39,500,000
Turkey	32,000,000

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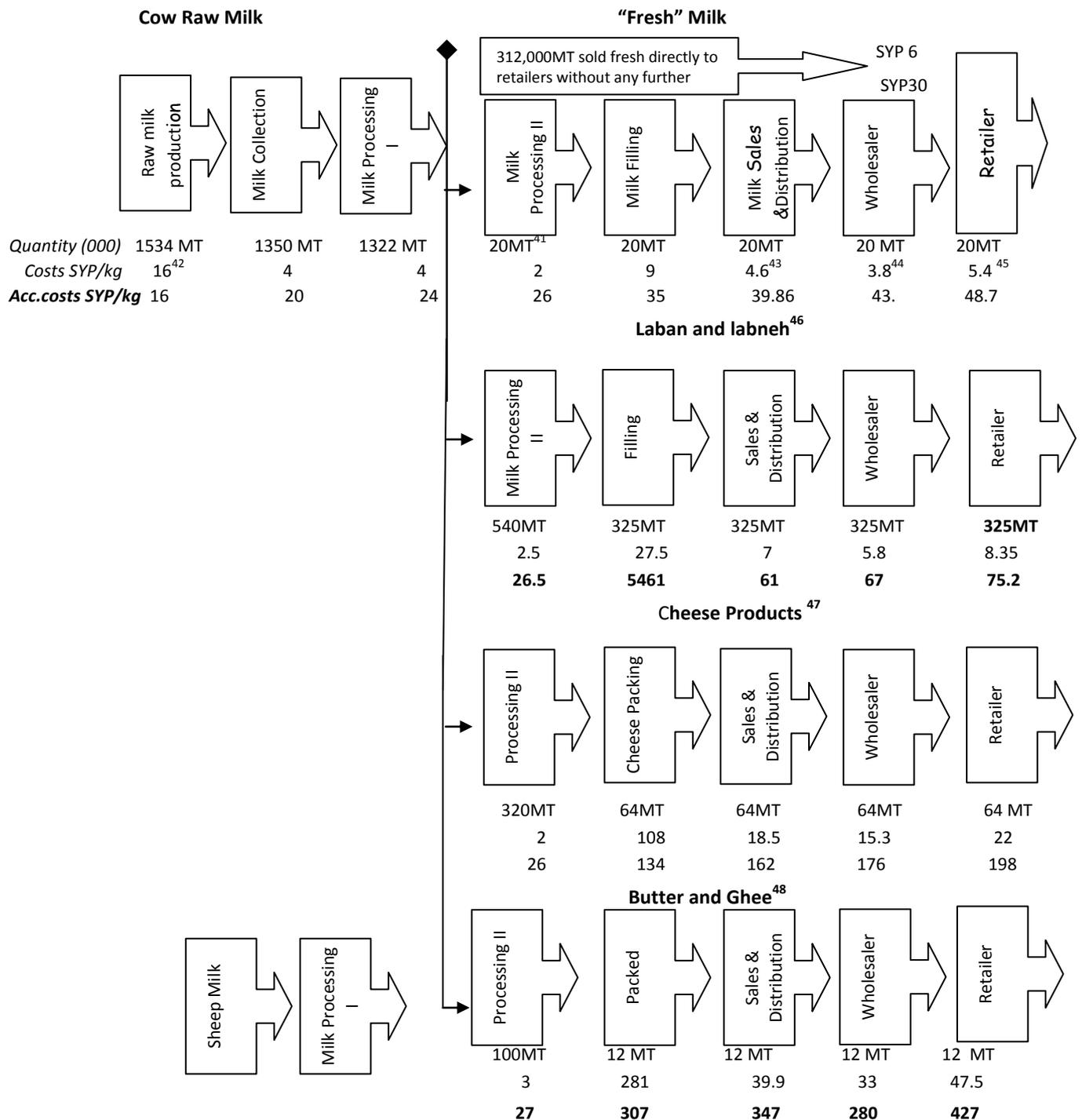
Recommendations

- The control of the informal market through an organization of the Hallab. As long as individuals or entities or associations can collect, sell and distribute milk or milk products without any public control on quality and hygiene, there is no possibility for the dairy sector to evolve in a positive direction. The main reasons being as follows;
 - The possibility of stabilizing prices is not an option.
 - The ability of the informal market to operate freely at all levels will not allow even the success of niche markets or export markets.
 - The decisions to invest in the sector will become too risky.
 - The decision to invest in the development of the sector will not be motivating.
- Formal Dairy producer should align on a common marketing strategy which begins at the Syrian consumer level. National marketing campaigns should be directed towards acquiring the confidence of that consumer, not only on a quality level but also on price level.
- The proper labeling and identification of milk and milk products to comply with the current regulations. An informative label has various advantages:
 - It complies with the labeling standards.
 - It describes the product ingredients leaving the consumer the choice of purchase.
 - It is a catalyst for the confidence building between producers and consumers.
 - It is distinguished from badly or non-labeled items.
 - It could focus on some health claims or product benefits.

7. Map of the value chain in terms of distribution channels.



8. Map of the value chain analysis in terms of added value: cow milk



⁴¹Qty based on UHT milk and pasteurized bottled.

⁴² Price obtained as average calculated price taking in consideration average national yield and average yearly yield in public farms.

⁴³Based on an average margin of 13%, upper or lower will depend on competition, if through wholesale or if direct retail.

⁴⁴Based on an average mark-up of 8.5%.

⁴⁵Based on an average mark-up of 12%

⁴⁶Based on 33% labneh and 67% of Laban.; packed.

⁴⁷ Based on 5kg milk per 1kg cheese; Cheese vary from 4.00 (Baladi) till 10.00 (Kashkval) kg milk/kg cheese.

⁴⁸Based on 60% butter (15%moisture) and 40 %Ghee(1% moisture)

For the sake of clarity, note some definitions:

Processing I: indicates first treatment and storage of milk before it is sold to processors..

Processing II: Indicates the process of transformation; any material removals or additions.

Filling: Implies addition of packing material. This completes the material cost.

Sales and distribution: Implies margins fixed by producers that should cover their profit and delivery costs to the market.

The above value chain map is based on average costs, taking into consideration the following parameters:

- Lowest and highest values in the mark-up range.

-The different types of items per category included in the chain. (Example labneh and laban)

It provides a good indication of the amount of value addition at the level of the sector as a whole, but could not be so indicative at the level of each individual item, or as an indication of the market final price since the average values are based on a wide range and that the production costs (direct and indirect) are not necessarily included as they could differ largely from unit to unit and from volume to volume. The reason that the sales and distribution range is quite wide is related to the different channels utilized by producers; Most Dairies for instance would prefer to reach retailers directly. Public factories prefer to pass through agents. Supermarkets impose much higher mark-ups than groceries; and so on. Item 7 shows the overall trend.

It should also be noted that the above chain represent mainly the general formal sector. The informal market behaves differently; it also does not fully apply on the Warshe that produce and sell their products in the same location.

Sheep milk products on the other hand follow a different routing. It is not possible to estimate the milk collection for sheep milk. Fresh milk is mainly consumed at the grazing sites or in the rural villages nearby or delivered to factories specialized in sheep milk cheese. Most products reach the market in the form of cheese, laban or labneh. The channels of distribution as well as trade mark-ups are similar to that of cow products.

9. The Regulatory status on Dairy products and Taxation

9a. Standards:

The dairy industry in Syria is regulated at different levels:

- Farm level: In terms of cattle and sheep imports and diseases.
- Price levels: The intervention of the ministry of economy on prices under decree no.
- Quality level: according to the 22 standards established by the Syrian Arab standards and metrology organizations (SASMO) that put norms and limitations on Dairy products, their packaging and the microbiological criteria.

Irrespective of whether the regulations are all justified or needed, the major controversial issue is the level of application of the rules. According to market discussions as well as records seen in the technical section of the ministry of economy, a good number of sub-standard dairy products are being commercialized on the markets under different brands and most of the time unbranded. This applies to those items which are part of the formal market; the informal market is practically without any control.

Examples of non-standard products:

- Wrong labeling: producer address is not mentioned, lot number is not present, and percent fat in dry matter not mentioned,
- Non-compliant with standard of the specific dairy product: ex: powder milk is utilized while it is prohibited, mixture of cow or goat milk with sheep milk, level of bacterial count too high ,and so on.

9b. Pricing:

A periodical list of consumer prices to be set by the Ministry of economy based on decree no.123 of 1960 and the decrees that followed. Based on these Dairy products prices are set as an indication to follow, as prices have been liberated according to the decree No. 718 of 2003.

9c. Taxation

Milk and Dairy products are not submitted to government taxes.

10. Supporting organizations

- MAAR: It supports via its establishments the Syrian livestock sector through the provision of various services in the form of free veterinary care, race improvements (By hybridization and artificial insemination), and feed provision with some free subsidy, data collection and distribution. The GECTP and the GEF cover part of the feed demand by local procurement, storage and marketing.
- FAO has its own office in Damascus provides indirect support to the Syrian Government through various long term projects which include studies ,training and data collection on the development of the Agricultural in general including the Dairy sector.
- General commission for scientific and Agricultural Research (GSAR):
Work is being regularly done on the improvement of the cow and sheep productivity through research done on the SHAMI cow and the AWASSI sheep.
- ICARDA: projects related to the development of grazing areas.
- UNIDO. Projects related to the development of the Industry.
- NAPC: Provides support in the collection and dissemination of data.

11. SWOT analysis of the Dairy sector.

<p>STRENGTHS</p> <p><u>Milk Production</u></p> <ul style="list-style-type: none"> • Syrian consumer habits favor consumption of dairy products. Yearly increase in consumption is noted. • All Pre-requisites for a good dairy production exist and are viable: Land, animal wealth, nutritive local feed. • Diversity of milk sources; Cow, Sheep and goat. • Government highly supportive at the level of agriculture. <p><u>Milk Processing</u></p> <ul style="list-style-type: none"> • Availability of a large barely explored local market. • High growth in exports to neighboring countries. • High demand on new investment. • Good aptitude of the dairy sector for new technology. • Syrian know how and specificity in some dairy products. (Shilal, Tsurki,). 	<p>WEAKNESSES</p> <p><u>Milk Production</u></p> <ul style="list-style-type: none"> • Scarcity of water resources in certain areas. • Absence of a consistent milk quality. • Non-compliance of a large portion of milk with international sanitation norms. • Average milk yield in cows is relatively low. • Lack of sufficient milk collection centers. • Lack of qualified personnel at the level of farm management. <p><u>Milk Processing</u></p> <ul style="list-style-type: none"> • Weak supply of good quality milk to the industry. • Low profit margins as a result of informal competition and limited purchasing power of consumer. • Consumer habits favoring in house processing. • Reluctance to opt for international quality systems among industries. • Export market is price oriented. • Low consumer confidence in processed items and low consumer quality awareness.
<p>OPPORTUNITES</p> <p><u>Milk Production</u></p> <ul style="list-style-type: none"> • Increase the self sufficiency of Syria and provide better nutrient value to consumer. • Upgrade of the quality and yield level of milk. • Development of a new network of highly efficient privately owned farms. 	<p>THREATS</p> <p><u>Milk Production</u></p> <ul style="list-style-type: none"> • Persistence of the unstructured milk market as a result of informal sales channels and its negative impact on the sector development. • Disappearance of grazing area as a result of drought and fast urban development that has been hitting Syria the past

<ul style="list-style-type: none"> • Exploiting the sheep and goat animal resources. <p><u>Milk Processing</u></p> <ul style="list-style-type: none"> • Developing the export potential to neighboring countries and EU, where quality standards are more applied. • Development of new diversity of products with a higher value addition and less prone to unfair competition. • Increasing ROI for farmers as well as for dairies. 	<p>decade.</p> <ul style="list-style-type: none"> • Lack of compensation or guarantees for farmers who loose cattle as a result of accident or sickness reduces motivation to grow. <p><u>Milk Processing</u></p> <ul style="list-style-type: none"> • De-motivation of industrial investors as a result of unfair competition. • The soft application of regulatory product and hygiene norms will eliminate any price /quality benchmark in the market. • Penetration of imported products from neighboring countries as a result of a better quality image. • The increasing reliance of consumers and processors on powder milk for quality and for price.
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12. Conclusion and Recommendations

The dairy sector in Syria extends to all the regions of Syria mainly as a result of its linkage to the Agricultural sector as a whole, viewing the importance of this sector in the development of the Syrian economy. This situation has partly influenced the proper development of the industrial aspect of the sector by short cutting in certain instances part of the value chain. This also explains the presence of a powerful informal sector.

The consumption habits of the Syrian consumer and his reliance on the Hallab or the intermediary person should not be underestimated while formulating a successful industrial set-up for the Dairy sector; another important parameter not to underestimate is the lack of confidence of the Syrian consumer in the quality of the commercial dairy products compared to his perception that what he buys from the Hallab is more genuine,...and cheaper.

The government, who not so long ago had full control on the economy and who at present has decided to liberate the Dairy sector, should take in consideration the linkage between the two sectors and that the support it provides Agriculture should also be provided to the Industry. Furthermore that the development of the dairy sector should not be considered as an extra burden on the purchasing power of the Syrian consumer, but rather as a means for the upgrading of the quality of life as well as removing the distorted situation of unfair competition.

If the existing system based on Hallab and Warshe is the system that works well for the local market, and constitute an important means of employment for a large number of people then the solutions should not be in disrupting it. On the other hand if the government chooses to ignore the problems of the Dairy sector such as improvement of the milk quality, standardizing the dairy products, fluctuating price of feed and consequently of the milk, the

lack of sanitation and hygiene culture in the production, handling, storage and transportation of dairy products, the low value addition on the dairy items exported, and many others, then the hope of a structured market and a developed dairy sector is highly threatened.

Furthermore a closer look at the foreign trade which is showing a significant yearly increase, and evaluating the types of products exported, it appears that the bulk is composed of intermediate processed products with a minimum value addition. This could lead to the conclusion that the growth might be related to the deflated price of milk in Syria and that any price adjustment, which looks to be essential for the development of the sector, could alter negatively the volume of exports in the future. As a consequence the Syrian Dairies will have to accommodate by developing more sophisticated, good quality products that could directly compete within the regional markets.

The development of export markets towards more developed countries such as the EU and USA will require as a start a strong effort from the state to obtain an international recognition from corresponding authorities in the other countries as to the safety of the animal production. In the meantime local Dairies should become more active in implementing safety systems such as ISO 22000, HACCP. In addition the niche market regionally and internationally available for dairy products which are made from sheep or goat milk is very poorly exploited by the local Dairies.

In that context some recommendations for the initiation of the Sector development:

At the public sector level:

- Initiate incentive schemes to farmers in the form of soft loans, cattle insurance, technical support, replacement of non-productive heads.
- Maintain and strongly activate the government support program in veterinary services, training of personnel, feed formulation and farm management.
- Activate Research programs related to breed improvement and other Research already undertaken by the Agricultural Research center.
- Application of Syrian vertical and horizontal standards related dairy products and to sanitary and Phyto-sanitary criteria, in order to reduce unfair competition and adjust the price positioning of the products based on quality and price.
- Provide incentives for the development of milk production in suitable areas such as AL Ghab, Al Badieh and Deir Azzor.
- Encourage the development of protected grazing areas for sheep and goat.
- Improve roads leading to remote farming areas, especially where grazing areas are concerned.
- Encourage the establishment of adequate collection centers (Refrigerated facilities, inspection labs, transportation means, and qualified personnel) and on a need basis.
- Facilitate as soon as possible the import of new heifer breeds with high milk productivity such as Holstein and Friesian.
- Regulate the import of powder milk; allow classification of the finished products according to content and type of milk so that the consumer can compare price with quality.

- Facilitate the acquisition of long term or soft loans through subsidizing interest rates for example.
- Apply strict regulations on quality and hygiene as well as on labeling rules to put pressure on some of the informal markets to follow the market rules.
- Encourage cooperatives that can group as much as possible of the small producers in order to regulate production, quality and assure the interests of those producers. It could also become a trigger for the development of Industrial coops to complete the value chain; similar to what is taking place in Europe.

At the Private sector level:

- Dairies should group together to form a lobbying power that can impose some market rules as well as finance consumer awareness campaigns to highlight the quality of processed dairy product.
- Dairies should invest more time and effort in implementing quality management issues in order to improve their internal performance and facilitate access to new markets with items that can add more value.
- Dairies to Work together with milk suppliers on the improvement of the productivity of the livestock and milk transport conditions.
- Dairies to invest in new farms, in areas where land is cheap and abundant with the possibility of cultivating extra land around the farm, for green fodder and alfalfa to improve the quality of their feed and reduce its cost, while supplementing with high protein crops.
- Dairies to increase production efficiency and opt for a suitable marketing mix. In order to benefit from economies of scale, dairies should be able to produce high volume products, with small margins of profit and others Niche products with a higher added value.
- Dairies to invest more time and money in the development of new products, adapted to the Syrian market and to the regional markets; preferably those that are not produced by the WARSHE, even if the new market is a Niche market.
- New Factories to be established near Milk production areas, to reduce transport cost and avoid milk deterioration.

Annexes:

Annex A: List of Tables and Charts.

Table1: Fresh Milk production per type of milk during last 5 years.

Table2: Milking livestock; by type; by variety; by milk production & average yield.

Table3: Cost component for the production of cow milk in percentage.

Table4: Example of a cost sheet for cow (Homs chamber of Agriculture).

Table 5: Milk Productivity.

Table6: Milk Utilization for processing.

Table7: Prices specific to branded items.

Table8: Price specific to Bulk products.

Table 9: Syria Trade Universe.

Table10: Major Syrian exports (2006).

Table11: Major Syrian Imports. (2006).

Table12: Comparative exports with regional countries (2006).

Chart1: Fresh Milk production and Consumption.

Chart2: Cattle head vs. milk production over 10 years.

Chart3: Sheep heads vs. milk production of 10 years.

Chart4: Goat vs. milk production over 10 years.

Chart 5: Average Butterfat content in UK milk last 3 years.

Chart 6: Average milk prices in EU 2008.per selected country.

Chart7: Portion of processed milk compared to milk sold as fresh produce.

Chart 8: Milk type vs. processed dairy products.

Chart9: Processing flow chart-Laban and labneh.

Chart10: Processing flow chart Drinking Milk.

Chart11: Market outlets universe.

Chart12: Syrian Exports by specific country.

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