Inma Agribusiness Program

IRAQ DAIRY INDUSTRY

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Introduction

The dairy industry is present in just about all countries in the world with varying degrees of importance in terms of its role in the livelihoods of producers and in food consumption. In developing countries dairy is a growing industry even with most milk marketed through the informal sector. Milk is consumed in its natural form and also used to make a wide range of food products which include cream, butter, yogurt, ricotta, cheese, and ice cream. Humans drink the milk and make dairy products from a wide range of mammals including cows and water buffalo, goats, sheep, camels, and others. Besides the milk produced by the females, they are an important source of meats, especially in the developing world. Animal agriculture in general specifically dairy, are very important components of economic growth in developing countries.

Current consumption of dairy products in Iraq is heavily influenced by the Iraqi Public Distribution System (PDS), which is the largest public food program operating in the world today and at the present one of the main players and competitor in the Iraqi dairy industry. The monthly PDS basket of rationed goods currently includes 1kg of powdered milk. Free milk is hard to compete against. Other competitors include imported processed dairy products and milk powder. Exact figures are hard to find; however, it is estimated that 120,000 to 200,000 tons of powdered milk per year are imported into Iraq along with substantial amounts of UHT milk, cheeses, processed cheese, butter, yoghurt, and flavored milk. There are dairy plants processing imported powder and Iraqi produced milk into yoghurt, cheese, ice cream, etc. There are some commercial dairy farms producing milk and processed dairy products, but most of the Iraqi produced milk comes from small dairy farmers with only a few cows. More information needs to be gathered as will be recommended in this report.¹

According to Ministry of Agriculture figures, there are 1,064,404 head of cattle, 146,092 head of water buffalo, 13,793,789 sheep, and 645,662 goats in Iraq. Combining cattle and water buffalo figures, there are over 1,200,000 head. We know that nearly half are bulls, and another 1/3 to ½ are non-lactating females which leaves 300,000 to 400,000 lactating females. Let’s assume they produce 5 liters per cow per day for 220. This will equal approximately 165,000 tons of fresh milk.

The dairy market already is at a remarkable size when which includes Iraqi produced fresh milk and imported products with a value of approximately $700 to $800 million at the wholesale level. The annual per capita consumption for traded milk is estimated to be 55 liters, of which probably only 5 liters are of “liquid milk”. The per capita consumption pre-embargo was 60 liters and in neighboring countries it is 96 liters. Iraq, with a population of 26 million and a birth rate of 4.2 children per family, has outstanding potential for growth in the production, processing, and marketing of dairy products. The demand for Laban (consumption estimated to be 60 liters per capita) provides another outlet for liquid milk.²

The potential growth is great because of a growing population, the increase in the proportion of young people who naturally eat more dairy products, the demand for protein rich foods, and the potential of the land with improving irrigation systems to product an abundance of

² Ibid.
quality animal feeds as the economy improves. As the constraints are eliminated, domestic and foreign investments in the industry will increase as well as higher priced imported dairy products. To what extent domestically produced milk and dairy products can be competitive is yet to be determined. This report will address the needed interventions in the value chain, and the studies that yet need to be done before major investments are made. The chain that goes from the cow to the kitchen table has several important links, each of which must not break.

Constraints

The war and civil rivalries between competing ethnic groups creates security problems for farmers, agribusiness, and consumers. Farmers have trouble getting inputs such as feeds, fertilizer, seeds, veterinarians, and other inputs; and getting their produce to market affecting the fresh milk supply for processing plants.

Electricity is an essential in the cold distribution chain for cooling milk and operating new technology on the farm, for operational procedures for various manufactured dairy products in the plant, and running consumers’ refrigerators to keep dairy products from spoiling fast. The electrical supply is unreliable because it operates at only 4 to 6 hours a day in urban areas and less in rural areas. Generating electricity on farm, processing plants, and in homes is very expensive thus adding more cost to the domestic production along the entire value chain.

Price is important when taking into account the average size of the Iraqi family. PDS food distribution system and the influx of imported dairy products, much of which is subsidized, challenge the competitiveness of both Iraqi produced processed dairy products and the production of fresh milk. There is a lot of interest in the development of dairy in several provinces of Iraq both at the factory and the farm level, as evident from the Job Order request from PRTs and Inma regional representatives; however further cost analysis studies need to be done to determine competitiveness. An outline of what is needed to establish a large commercial dairy production center in Iraq was prepared as a result of a Job Order request from the Governor of Anbar Province and BD PRT. Another Job Order proposal creating a milk collection system for small farmers to sell their surplus fresh milk, was prepared as a result of other Job Order requests from several PRTs. There is a need for further evaluation to determine the practicality and competitiveness.

Feeds and forages are not produced in sufficient amounts or good enough quality to adequately feed the local cattle to produce meat and milk efficiently. This significant constraint is evident by the observation of large numbers of cattle in the villages and countryside. In many cases, the farmers cut grass each day and bring to their cattle or simply have the cows scavenge the area to get what they can. The cows may or may not get a full belly, but they do not get proper nutrition. Straw is fed to cattle, but straw has only 1/6th the feed value of alfalfa hay. The farmers have little knowledge of the value of good forages for feed, and how harvest time and post harvest storage affects the feed value. For example, after grasses and legumes reach their optimum feed value at pre-bloom, they lose ½ of 1 % of the feeds protein nutrient value per day for every day after that until it is cut. Alfalfa at the pre-bloom stage is about 21% crude protein on a dry matter basis. If it is cut 20 days later,
the crude protein will be 11%. Therefore, the alfalfa goes from an excellent high value protein feed to poor quality feed. In terms of meat and milk production, that would cut the daily rate of gain for meat, and the daily milk production in half. In a large feed trial in Armenia involving 200 head of local dairy cows, they were able to increase average annual production per cow from 1,500 liters to 4,000 - 5,000 liters just by feeding early cut grass and alfalfa hay with no grain supplement. Improving forage quality just by cutting it at the proper time is the lowest cost method to doubling production by producing high quality protein nutrition, which is in short supply in Iraq. This alone could significantly reduction in costs input feed/liter from $0.19 to $0.13.

Cows scavenge for feed

Baled straw for feeding dairy cows

Alfalfa in growth and in bales

Alfalfa is a high value crop and an affordable source of protein for cattle, but the feed value is unknown to most farmers, it is only harvested by hand and fed green, and it is not fed in sufficient amounts which are evident in the very thin and low producing cows.

Veterinarian services have been curtailed, thus impacting animal agriculture production efficiency and food safety. Private veterinarians have been afraid to go out and visit farmers in villages however that fear seems to be lessening now.

Most commercial dairy farms that were once producing milk for the country are no longer in operation and many owners have left the country. Commercial milk processing plants are operating however we need to know if they want more fresh milk and if locally produced fresh milk can compete with imported powder and other dairy products.
Interventions

Because the growth of the Iraqi fresh milk supply will take a relatively long period of time, milk processing plants will have to rely on imported powder and other products to maintain needed product volumes. There are benefits to increasing the local milk supply to the processor for the local economic development and both large and small dairy farmers. A study needs to be done to determine the competitiveness of existing large, medium, and small farmers.

In this value chain five intervention points are indicated as the most critical in getting an increase in local fresh milk of better quality and from healthier animals.

The recommendations interventions are:

**Area I**

- Short Term Storage - Establish village milk collection centers with small milk cooling tanks and small generators for small village herds where milk is collected twice a day and delivered to processing plants every other day. The small herd owners will deliver their milk to the collection center immediately after milking where it is tested, weighed, strained, and cooled to below 5 degree centigrade. Large herds will need their own cooling milk tank for their milk. The collection center manager will need training and testing equipment to assure milk quality.
- Transportation - Introduce insulated bulk milk tank trucks to take cold milk from the larger dairies’ cooling tanks and milk collection centers to the milk processing plants. These trucks could be owned and operated by a private trucking company.

**Area II**

- Milk Packaging and Processing - Improve the processing and packing technology in the processing plants. Assist with the upgrading of milk processing equipment that would improve efficiency, product quality and safety, and shelf life where refrigeration is difficult.
- Economic study of the market and operating cost – A comprehensive dairy market analysis is needed including the possibility of a powder milk reconstitution plant.

**Area III**

- On-farm production - Work with established, producing dairy farms, both large and medium size, to evaluate their present feeding and management and to develop changes that will make them more efficient and profitable as well as improve their milk quality and safety.
- On-farm production - Conduct educational programs, demonstrations, and trials at larger producing dairies and near to milk collection centers where cooling tanks are installed.

## Recommendations

_Inma’s_ work plan includes development of the dairy value chain. Interest is growing from community leaders, farmers, and PRTs to restore or build milk plants, start collection centers for villages, and improve dairy farm production. The following are observations and recommendations on each of the three targeted areas of the value chain.

### AREA I: SHORT TERM STORAGE

Fresh milk produced in Iraq is used on the farm for daily family usage and feeding calves. Milk is sold directly to consumers or to middle men who go through the village once a day. The milk dealers deliver the warm milk to collection centers where the milk from many different villages is cooled before the cold milk is transported to dairy processing plants. This process allows warm milk to sit over night at the farm where it is mixed with warm milk from the morning milking and then sold to the dealer where it is weighed and put into cans for transportation to either a cooling center or directly to a processing plant. Warm milk is an excellent medium for bacterial growth which causes fast milk spoilage. Bacterial growth is greatly restrained when milk is cooled to below 5 degrees C immediately after leaving the cow.

On November 26 and 27, the _Inma_ staff was given a tour of the area between Abu Ghraib and Taji. Observations related to dairy included alfalfa fields, hay balers that were used for baling straw, cattle that were producing milk, and a successful milk collection center that was collecting, cooling, and delivering cold milk to the Abu Ghraib Dairy. The private owner of the milk collection center said that he could sell much more milk to Abu Ghraib Dairy if he could get it. He said that the dairy liked his milk because its quality and they could make higher value products from it (as compared to warm milk collected from other villages). The owner of the milk collection center said that his business was profitable and that he would like to expand.

**Recommendations: Abu Ghraib Dairy**

- Arrange a meeting with the management of Abu Ghraib Dairy to: explore their interest in more milk collection centers that cool milk and promote milk quality and safety, understand their vision of the future for the dairy industry and their business,
ask how much milk is produced in their region of operations, what percentage of it is sold to their plant, what dairy products do they make, and how their customers store the products they buy given the electricity situation.

- Meet again with the owner of the milk collection center to: explore the interest and opportunity to expand his business and others like it, get an idea of the number of cows in his region and neighboring areas, and to see what he needs to expand.
- Contract someone to conduct a survey of the region to: estimate cow numbers, find other small businesses that are collecting milk for Abu Graib Dairy and other milk plants, and meet with local government officials and farmers to determine the desire and interest in dairy industry development.
- After receiving information and recommendations from the above activities, Inma should decide if a demonstration project in the area would be feasible.

Inma personnel have met with the management of the Modern Company, Mr. Fasal Al-Hayany General Manager. According to Mr. Hayany, the company operates among other businesses a milk collection center, milk processing plant, and a large dairy production farm. He stated that they cannot make money with their large dairy farm; however they do make money from the milk collected at the collection center. The only problem with that milk is milk quality. When asked if he could use more fresh milk from the collection center, he said, “Yes especially if the quality would improve.” The Modern Company has one central cooling station where the warm milk collected from many villages is transported to be cooled. There are no cooling tanks in the villages for twice a day collection and cooling.

A visit to the Balad Canning Factory was made by INMA staff. Of their five product lines, one was dairy products. Their total milk supply came from locally produced fresh milk.

**Recommendations: Balad Canning Factory**

- Meet with the management of the Modern Company and the Balad Canning factory to learn more about their businesses, discuss the village milk collection cooling tank concept, and see if that might make sense to their operation over the present methods.
- If possible visit their milk plants and commercial dairy feedlot to evaluate the conditions and management methods.
In late September 2007, the Governor of Al Anbar Province, asked Inma for an assessment of the capabilities of a dairy industry there. The Inma project review committee approved this study and an Inma dairy specialist was assigned to manage the study.

**Recommendations: Al Anbar**

- The dairy specialist should meet with the local government officials of Anbar to review the dairy guidelines as sent earlier and to understand their interest.
- After that meeting, proceed with a limited dairy analysis study.

**TRANSPORTATION**

There is a fresh milk market in Iraq, but it is very difficult to get numbers. Inma regional staff and military personnel have observed people marketing milk from their own cows out of closed pails door to door in villages and in Baghdad. This is mainly observations that we have seen or were told.

Surplus milk not used by the family or sold direct to consumers is transported to the processing plants in fiberglass or metal containers either warm or cold. This method is conducive to bacterial growth, especially for warm milk. No insulated milk trucks have been observed that move cold milk from cooling tanks at village collection centers or from larger dairy farms that have their own milk cooling tanks.

**Recommendations**

- A cost analysis study that includes operation, repair, and maintains should be done on individuals or companies to purchase and operate milk trucks that are made of stainless steel and insulated.
- Milk transported in insulated trucks from collection centers and farms with cooling tanks would maintain low bacterial growth and limit other contaminates from entering the cold milk.
- If milk collection centers are started, a milk truck owned by an individual or the milk processing plant should be considered.
- New or used milk trucks are available for purchase from the West.

**AREA II: MILK PACKAGING AND PROCESSING**

Several milk processing plants are operating in Iraq, including the three mentioned in this study that are making dairy products for the market. They are overcoming the constraints and are interested in growth and new technology. Though imported milk powder is used in the milk processing plants, they are purchasing locally produced fresh milk to produce products for the market. The processors want local milk of good quality.
Recommendations

- INMA should recruit a dairy processing plant specialist to provide technical assistance to modernize the present milk processing plants or build new plants.
- Milk collection centers and low cost commercial dairy farms will be needed to supply the growing dairy industry with a healthy supply of efficiently produced fresh milk.
- Good quality dairy products start with the cow.
- An economic study should be done on a powder milk reconstitution facility.

AREA III: ON-FARM PRODUCTION

In order for the dairy industry to be competitive with imported dairy products and produce a safe product, it must start with the producers. There are a few large producing dairy farms, but most of the cows are owned by small farmers with just a few cows. The cows that have been observed are in poor condition, because of the lack of knowledge about proper animal nutrition, the type and quantity of feeds fed, and animal health. All the beef that is consumed in Iraq comes from the male offspring of the dairy cow and the cows themselves when culled from the herd. Therefore, the feeding and management of the dairy cow impacts both the dairy and beef industry.

Recommendations

- Establish milk collection centers and encourage the establishment of low cost commercial dairy farms near milk processing plants.
- Conduct feeding trials, demonstrations, and seminars on the proper feeding, housing, and management techniques of dairy cattle and beef cattle.
- Alfalfa hay and silage are excellent feed for both milk and beef producing cattle. Develop an alfalfa project that demonstrates proper seeding, harvesting, and post harvesting of alfalfa hay and silage. Demonstration plots should be located near milk collection centers, commercial dairy farms, and beef feedlots.
- Start a beef feedlot project to demonstrate the value of alfalfa hay, proper nutrition, and high quality beef. This will benefit both the dairy and beef industry by demonstrating the value of good animal nutrition.
Appendix

Distribution of Cattle in Iraq

Distribution of Buffalo in Iraq

Source: MoA Veterinary Company Dept of Planning Aug 2006