



North East Syria Sector (NES)  
FOOD SECURITY & LIVELIHOODS  
Agriculture Working Group



# Value Chain Assessment Milk and Dairy Products

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## 1. Introduction

The conflict and COVID-19 pandemic have significantly impacted the dairy sector in Syria, with a 47% decrease in milk production between 2010 and 2019, leading to food insecurity and nutrition challenges for many Syrians.<sup>1</sup> In response, the Food Security and Livelihood (FSL) Cluster in Northeast Syria (NES) and iMMAP assessed the dairy value chain in NES, focusing on input supply chain management and output markets of milk and dairy products in the region. This assessment aims to provide an in-depth analysis of the dairy value chain in northeast Syria, including the sector's current state, stakeholders' challenges, and potential opportunities for growth and development.

The challenges faced by the dairy sector in Syria emphasize the immediate requirement for assistance in rebuilding the industry and guaranteeing the availability of dairy products that are both safe and nutritious for all Syrians. As a result, the objective of this assessment is to identify the key obstacles and potential areas of improvement within the dairy value chain in northeast Syria. By effectively addressing these obstacles, the dairy sector can enhance its ability to withstand challenges, boost production levels, and ensure the provision of vital nutrition to the population.

## 2. Methodology

This study employs key informant interviews with stakeholders and households to examine the current status of the dairy value chain in NES. It explores the norms governing milk and dairy trading, explores the economic, social, and environmental consequences of the value chain on different stakeholders including farmers, processors, retailers, and consumers. Furthermore, it evaluates how external factors such as policies, regulations, and market trends influence the dynamics of the value chain.

### 2.1. Data Collection and Geographical Coverage

The study involved conducting site visits to four governorates in Northeast Syria, namely Aleppo, Al-Hasakeh, Ar-Raqqa, and Deir-ez-Zor, covering a total of 29 sub-districts located across 11 districts in the NES region. The data collection process included conducting 305 in-person interviews with various actors in the dairy value chain, including milk producers, milk collectors, dairy processors, retailers, wholesalers, and consumers. It is worth noting that some of the actors in the dairy value chain play multiple roles. For instance, there are milk producers who also function as dairy processors or milk collectors, and there are milk collectors who also process milk into dairy products.

Figure 1 provides a detailed breakdown of the study's coverage for each actor.

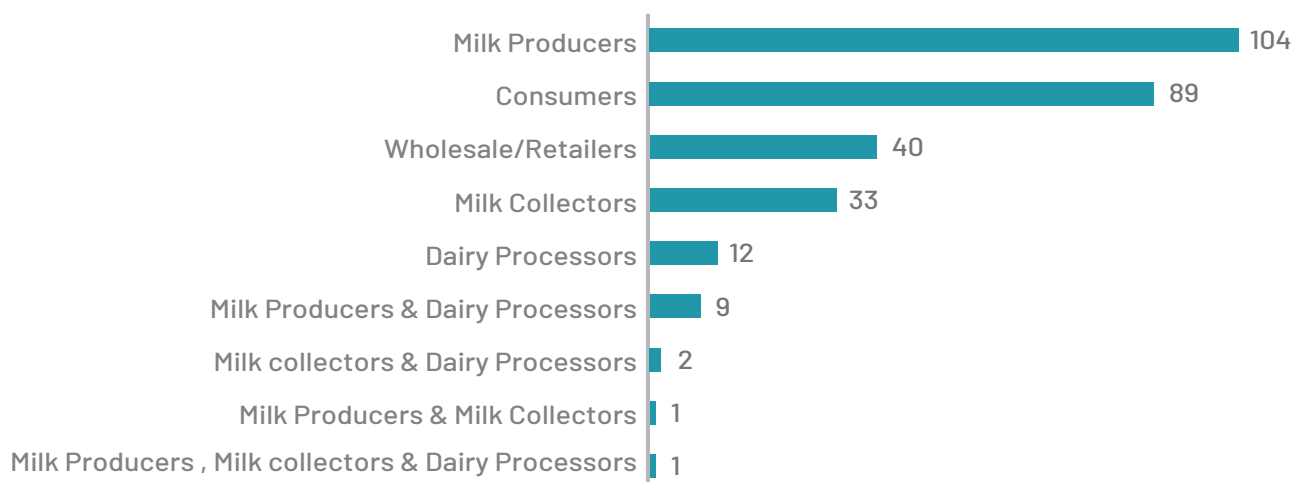


Figure 1: Number of KII per Market Actor

## 2.2. Assessment limitations

The assessment has some limitations to consider. First, it relied on purposive sampling and therefore the results must be regarded as indicative and not representative. The sample sizes for each dairy value chain market actor were particularly small. Actors also tended to be located within close distances of each other, largely in urban areas and particularly for milk collectors and traders. However, it is important to note that the actors were chosen according to specific selection criteria, enabling the collection of data from a sample that possesses greater understanding and involvement within the dairy value chain. As a result, the data obtained provides a more representative indication of the current state of the dairy value chain.

Criteria for Selecting Assessment Participants:

- **Milk Producer:**
  - Regularly deliver milk to milk collectors, to the market, or to the processing unit.
  - Owns not less than 5 cows/buffalo or 20 sheep/goats.
  - At least 50% of the milk production is sold.
- **Milk Collector:**
  - Collect milk from at least 3 milk producers.
  - Operational at least 2-3 times per week.

- **Dairy Processor:**
  - Regularly convert milk into dairy products.
  - At least 50% of products are sold.
  - No less than 3 different types of products are produced.
  - Priority for large to medium size producers over household producers.
- **Wholesaler and traders:**
  - Regularly sell milk or dairy products in the market.
  - No less than 3 different types of products are sold.

Despite these limitations, the assessment provides a useful starting point for understanding the challenges and opportunities within the dairy value chain in NES and offers insights into potential areas for growth and development.

### 3. Market Infrastructure

#### 3.1. Climate factors

The winter season of 2022-2023 in Syria was marked by a low amount of rainfall received in comparison to the region's long-term rainfall average.<sup>2</sup> The region experienced a significant shortfall in rain levels between December and February, with levels falling far below the average for this period. The low rainfall levels will negatively impact the dairy value chain, through the lack of water and green fodder availability for dairy cattle and in turn affect their health and milk production levels.

#### 3.2. Farming inputs

Livestock production in Northeast Syria is facing a serious challenge due to the low availability and unaffordability of animal feed and green fodder, as reported in the Animal Feed and Fodder Manufacturing Facility Mapping assessment conducted in NES by iMMAP<sup>3</sup>. This has led to an increase in the cost of imported feed and fodder, which has a direct impact on livestock farmers, who are becoming increasingly dependent on imported feed and fodder at higher prices.

Moreover, the shift towards trading and grinding services instead of local production of animal feed indicates that traders have a greater import record of feed, fodder, and raw materials. This shift is attributed to the high costs associated with local production and manufacturing.

The partial functionality of feed manufacturers and grinders due to the rise in production input prices and increased operational costs, indicates the decreased demand for locally produced animal feed. Hence, the current feed and fodder market imposes significant challenges on livestock farmers in Northeast Syria, who may be forced to rely on natural pasture due to the increase in feed and fodder costs.

#### 3.3. Currency Depreciation

As of the start of January 2023, the Syrian Pound (SYP) experienced a significant decline compared to the US dollar reaching a value of 7,700 SYP/USD, a 50% drop in value compared to its worth in September 2022 (4,585 SYP/USD).<sup>4</sup> This substantial depreciation has had a considerable impact on the domestic currency's purchasing power and overall economic stability in Syria.

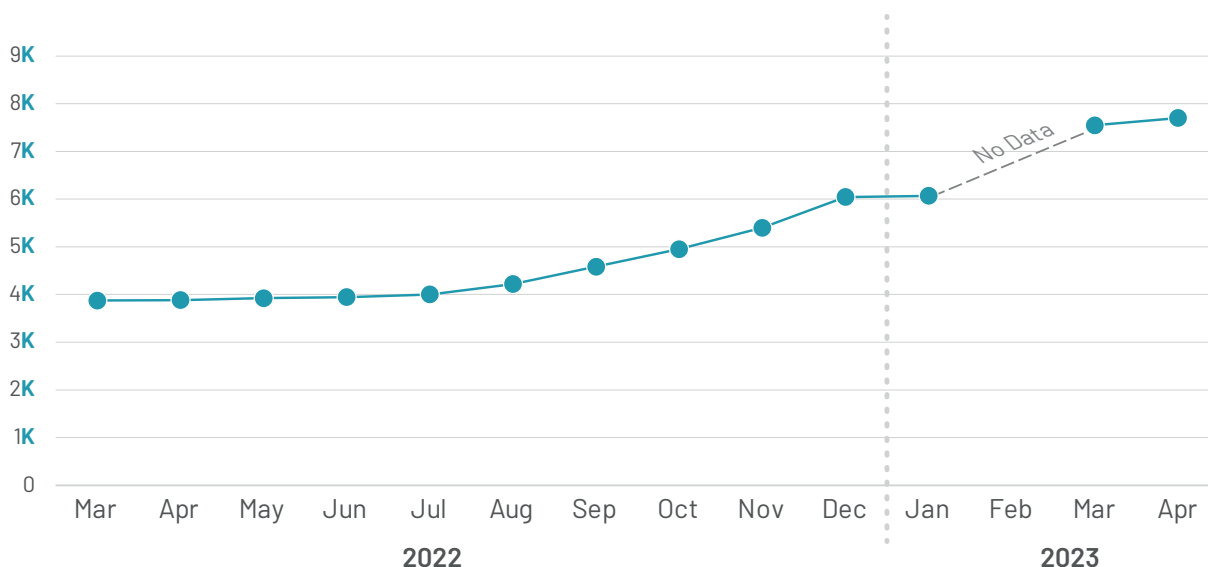


Figure 2: USD/SYP Exchange Rate - March 2022/April 2023

2 Seasonal: Rainfall and Vegetation: Visualizations - Dataviz | WFP - VAM | 2022-2023

3 Animal Feed/Fodder Manufacturing Facilities Mapping (NES) [Link](#)

4 Joint Market Monitoring Initiative (JMIMI) - Northern Syria [Link](#)

## 4. The Dairy Value Chain in Northeast Syria

The dairy value chain was categorized into five main stages: (1) milk production; (2) milk collection; (3) milk processing; (4) distribution and retail of milk and other dairy products; and (5) milk and dairy product consumption.

### 4.1. Milk production

#### 4.1.1. Inputs for Milk Production

The agriculture sector in Northeast Syria (NES) is an essential contributor to the region's economy, with around 39% of the population involved in agriculture-related activities such as crop production, animal husbandry, and forestry. In 2019, the sector contributed about 36.6% of the region's Gross Domestic Product (GDP).<sup>5</sup>

In terms of livestock farming, collected data showed that most farmers prefer cows over sheep for dairy production, with 43% of farmers breeding cows and 40% sheep. The average number of cows on a dairy farm is 4, while the average number of sheep is 70. Interestingly, only farmers in Al-Hasakeh reported breeding buffalo for milk production, and the highest percentage of farmers breeding goats was found in Deir-ez-Zor (32%). These findings suggest that cows and sheep are the most popular choices for dairy production

among farmers, but other types of livestock, such as buffalo and goats, are also utilized in some regions.

It is worth noting that the prevalence of sheep and goats in Deir-ez-Zor might be attributed to their drought-tolerant nature, suggesting a reliance on resilient livestock due to limited water availability. Conversely, areas with more favorable rainfall conditions, such as Al-Hasakeh and Aleppo, exhibit higher numbers of cows or buffalo, potentially benefiting from ample pasturelands and water resources.

Most of the farmland used for livestock in the NES governorates was owned by the farmers (89%). However, farmers in Ar-Raqqa governorate relied more on rented land than other governorates, and a higher percentage of farmers (13%) in this region utilized hired labor.

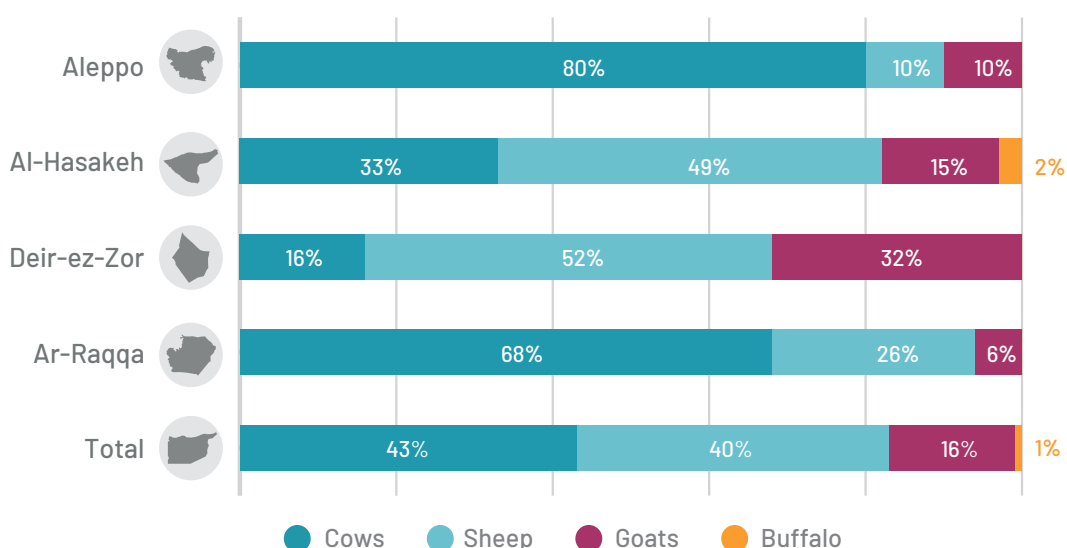


Figure 3: Percentage of Dairy Livestock Across NES Governorates



As for workers' gender and women's contribution in milk production, the study found that the percentage of women workers was equal to that of men across all four governorates, accounting for an average of 50%. However, in Deir-ez-Zor, the

percentage of women workers was higher than that of men, accounting for 57%. These findings highlight the important role of women in the dairy value chain in Syria.

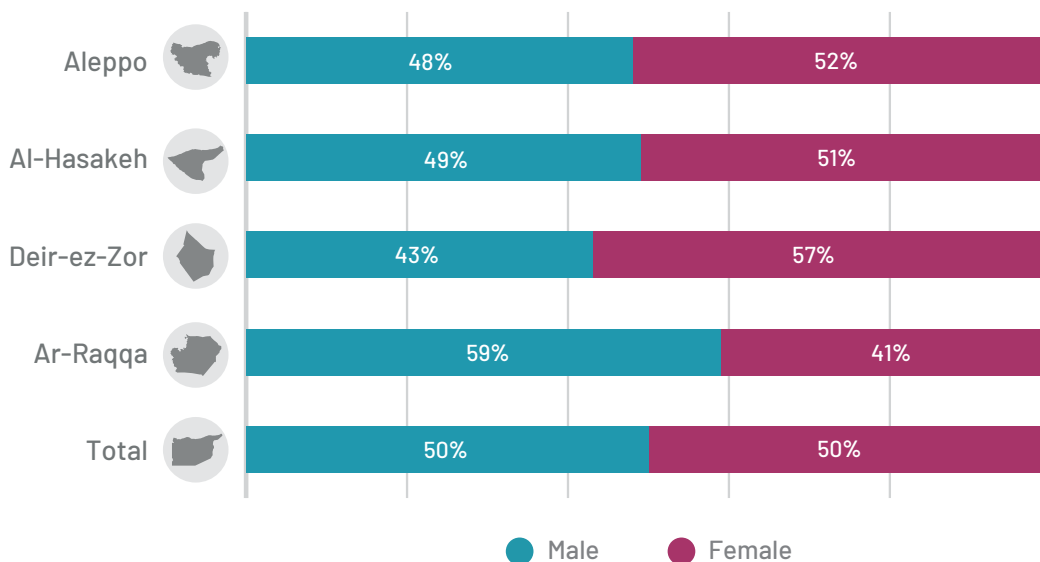


Figure 4: Percentage of Male and Female Workers

In terms of animal feed, livestock farmers in the NES governorates rely on multiple sources of fodder for their animals. The majority (91%) purchase feed and fodder from the market, while grazing is also a significant source of fodder for 62% of farmers. However, only 29% of farmers produce their own fodder, indicating a low level of self-sufficiency in green fodder production.

These findings are supported by data from the NES Animal Feed/Fodder Manufacturing Facilities Mapping report<sup>6</sup>, which highlights the low availability and unaffordability of animal feed and green fodder as relevant challenges to livestock farmers in the region. This has led to an increased dependency on imported feed and fodder, which is often priced higher than the farmers' financial capabilities.

#### 4.1.2. Milk Production and Processing Activities

On average, the overall cow milk production per day is 11.6 liters, with considerable variations among farms ranging from 2 to 25 liters per day. In Ar-Raqqa governorate, the average cow milk production per day reaches as high as 17.5 liters, representing the upper limit of milk yield. Conversely, in Al-Hasakah, the average cow milk production is comparatively lower, with a minimum average of 9 liters per day. On the other hand, the average sheep milk production per day is 0.7 liters with variations between 0.1 and 5 liters. Notably, in Aleppo, the maximum average sheep milk production per day is 0.9 liters, indicating the highest yield within the region.

Conversely, in Ar-Raqqa, the minimum average sheep milk production reaches 0.4 liters per day. Additionally, the average goat milk production per day is 0.8 liters per day, with variations between 0.2 and 1.6 liters. Al-Hasakah demonstrates the highest average goat milk production at 0.9 liters per day. In contrast, Aleppo exhibits a minimum average of 0.4 liters per day. The variations in milk production among livestock in NES can be attributed to several factors, including feed

quality and quantity, animal genetics, management practices, and environmental conditions.

Most of the milk produced on the farm (47%) is sold in local markets. Approximately 29% of the milk is processed into homemade dairy products. However, only a small portion of the milk is consumed as milk in households or used to feed calves and livestock.

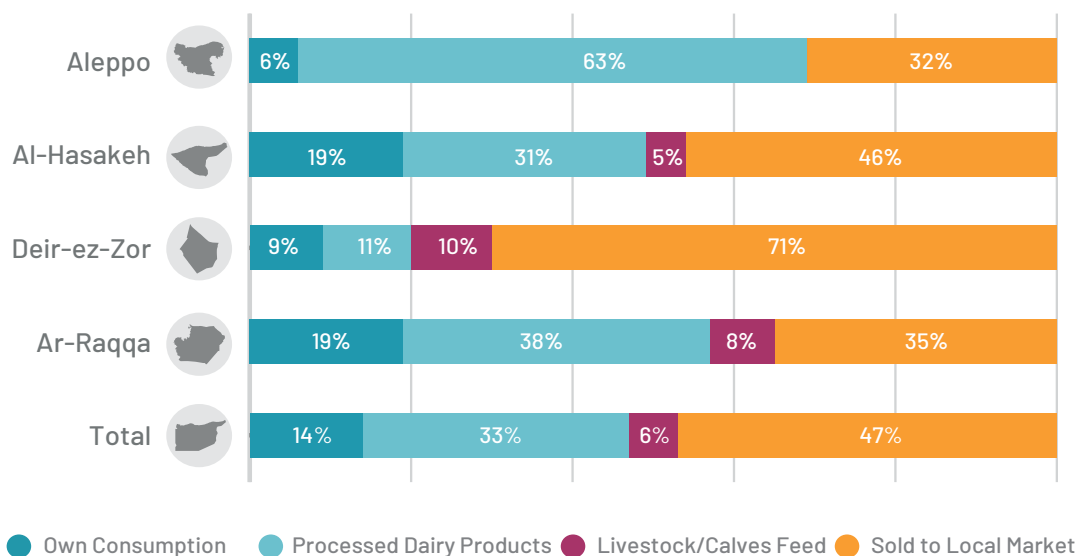


Figure 5: Percentage of Milk Usage Across NES Governorates

### 4.1.3. Quality Control Practices in Milk Producing

Farmers follow certain steps to ensure the safety and quality of their milk before its consumption or trade. These steps include filtering, pasteurizing, packaging, and refrigerating the milk. It is important to note that most farmers (70%) filter their milk before consuming it or selling it to others. However, a smaller percentage of farmers (30%) pasteurize their milk.

Pasteurization involves heating the milk to a specific temperature to kill any harmful bacteria present in the milk. While pasteurization is not mandatory, it is highly recommended by health experts to ensure the safety and quality of milk. Proper pasteurization can significantly reduce the risk of milk-borne illnesses and increase the shelf-life of the milk.<sup>7</sup>

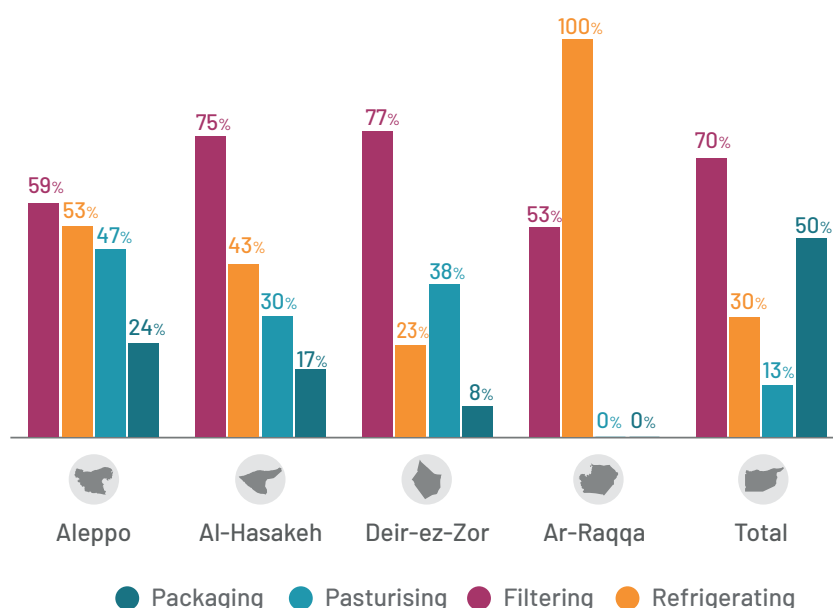


Figure 6: Percentage of Quality Control Measures Used Among Milk Producers

The quality of milk produced by farmers in the NES region is negatively impacted by several challenges. Only 11% of the assessed farmers in the region have adequate storage facilities for milk, and this number is even lower in Ar-Raqqa, where none of the assessed farmers reported having access to storage facilities. Insufficient refrigerated storage facilities are a significant challenge faced by 31% of farmers since refrigeration equipment are hardly available in the region. Other issues, such as the high cost and poor quality of feed and fodder, and the absence of upgraded machines for milk processing and sterilization tools, also negatively affect milk quality.

While farmers in the region conduct sensory evaluations of their milk, microbial testing is only performed by a small percentage of farmers (2%) in Al-Hasakah. This is concerning, as sensory evaluations are not sufficient to detect harmful bacteria or other microorganisms that could pose a risk to consumers. Microbial testing is essential to ensure that milk is safe for consumption and meets regulatory standards. It is important for farmers to prioritize the safety of their products and take measures to ensure that their milk is free from harmful bacteria.

The dairy farming industry in NES faces several challenges that can hinder the production of high-quality milk. One of the most significant challenges is the limited availability of specialized machinery and equipment, with only 11% of dairy farmers having access to such tools. This equipment typically includes milk tanks, milk churning machines, and milk separators. Moreover, many farmers have indicated that their equipment needs maintenance and upgrades to maintain optimal performance. It is important to note that regular maintenance and upgrades of equipment can help to enhance milk quality and quantity, ultimately leading to higher profits for farmers.

The main challenges reported by farmers in Aleppo and Al-Hasakah is the increasing cost of animal feed and fodder, which directly impacts the affordability of these essential resources. This concern was highlighted by 88% of farmers in Aleppo and 66% of farmers in Al-Hasakah. The rising prices of animal feed and fodder make it more difficult for farmers to provide adequate nutrition to their livestock, thereby affecting overall milk production.

In contrast, farmers in Ar-Raqqa and Deir-ez-Zor face different primary challenges. For farmers in these regions, the main issues are the mounting production costs and the financial constraints they encounter. Approximately 53% of farmers in Ar-Raqqa and 62% of farmers in Deir-ez-Zor reported these challenges.

#### 4.1.4. Sales and Marketing

In addition to selling their milk to multiple parties in the market, farmers in the dairy value chain in NES often rely on small vehicles to transport their product to buyers. Almost half of the assessed farmers (41%) sell their milk to wholesalers, while 38% sell it to retailers. This was followed by 14% of farmers selling directly to consumers, and 7% to dairy producers.

It is important to note that all assessed farmers in the NES dairy value chain reported selling their milk in the local currency, Syrian Pounds (SYP). This means that fluctuations in the exchange rate can have a significant impact on the profitability of farmers, as well as other market actors across the dairy value chain.

Figure 7 illustrates the percentage of sales of produced milk to each customer per governorate.

Figure 8 showcases the range of selling prices in US dollars per liter of milk for four different types of customers: wholesalers, retailers, dairy producers, and consumers. As depicted in the figure, the minimum selling price for milk is generally the lowest for wholesalers, who purchase large quantities of milk from dairy producers and sell it to retailers. Retailers, in turn, sell smaller quantities of milk to consumers at a higher price, which can vary widely depending on the market demand and competition.

Meanwhile, dairy producers often receive a higher selling price for their milk compared to wholesalers, but they also must bear the production and transportation costs. Finally, consumers may pay the highest price for milk. It is worth noting that the average profit margin for dairy producers per liter of milk sold is 20%, with variations ranging from a minimum of 5% to a maximum of 50%.

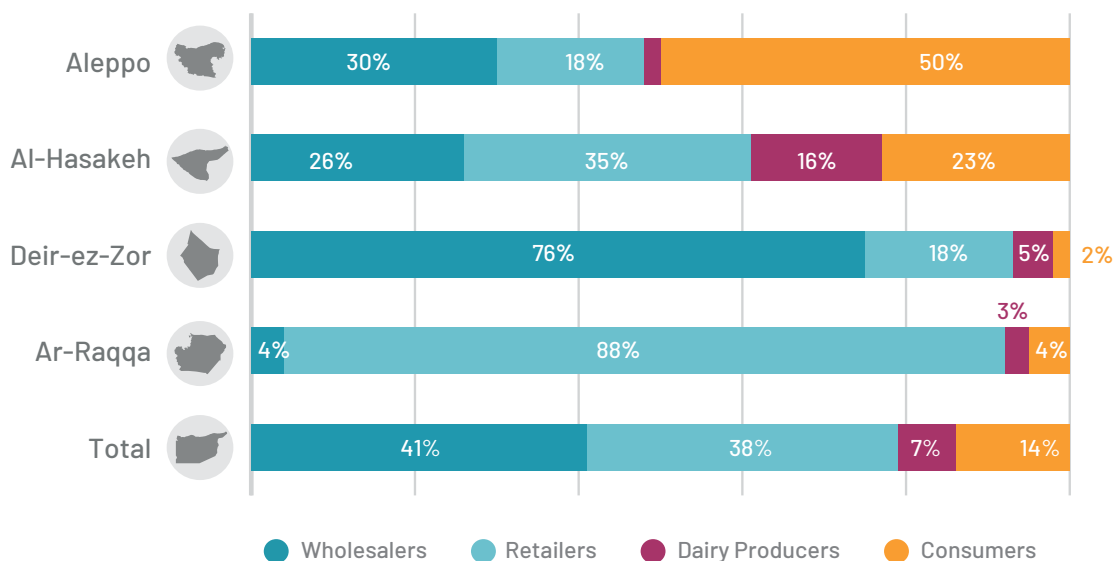


Figure 7: Percentage of Sales per Customer Type

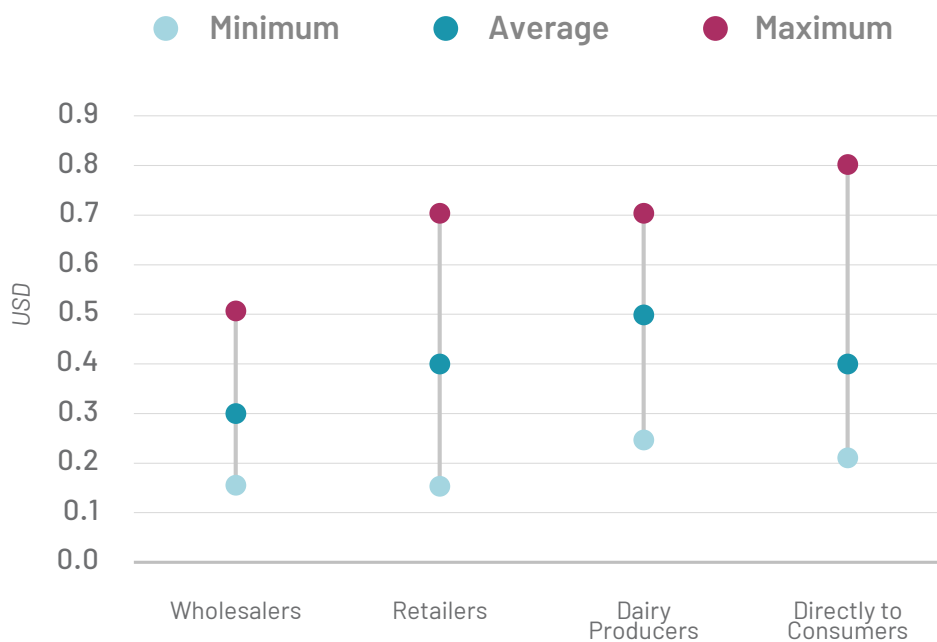


Figure 8: Selling Prices of Milk (USD/Liter)

Despite the fluctuation of prices, 73% of the assessed farmers in the governorates believe that they do not receive a fair price for their milk. The highest percentage of dissatisfaction was reported in Al-Hasakeh, where 80% of farmers expressed dissatisfaction with the selling price.

In response to this issue, farmers have identified key strategies that could help them secure a better price for their milk. These include enhancing the quality of their product, building stronger relationships with traders and other buyers, and seeking direct access to buyers without the need for intermediaries. By pursuing these strategies, farmers hope to improve their bargaining power and ultimately receive a fair price for the milk they produce.

#### 4.1.5. Investment and Growth

The success of the dairy value chain in NES largely depends on the investment and growth opportunities available to the farmers. However, the study reveals that many farmers in Aleppo and Al-Hasakeh lack the necessary funds to support business expansion, which hinders their ability to invest and scale up their businesses. This financial constraint is a significant obstacle to the growth of the dairy value chain in the region.

Moreover, farmers in Aleppo face another challenge, with the unavailability of inputs such as livestock and fodder significantly limiting their production capacity. This issue hampers their ability to scale up and invest in their businesses, further hindering the growth of the dairy value chain in the region.

To ensure the success of the dairy value chain in NES, it is crucial that farm workers possess the necessary skills to effectively manage livestock and produce high-quality milk and dairy products. This includes expertise in animal health and nutrition, milk handling, quality control, and marketing. However, finding workers with the required skills can be a challenge for many farmers, where 75% of farmers who struggle to find skilled workers attribute this difficulty to a lack of qualified candidates.

In addition to the challenge of finding skilled labor, farmers in different governorates of NES face distinct business obstacles. Aleppo and Deir-ez-Zor farmers struggle with limited access to essential resources such as electricity, water, fuel, and equipment. Meanwhile, Hasakeh and Ar-Raqqa farmers cite difficulty accessing finance and loans as their primary challenge.

Only farmers in Ar-Raqqa district reported being affiliated with a cooperative related to their business, and out of these cooperatives, only one of these cooperatives provides services related to supplying necessary fodder to the farmers. This points to a lack of cooperative infrastructure and support for farmers across the dairy value chain. Furthermore, the support from NGOs appears to be limited as well. Only a few farmers from the Al-Malikeyyeh and Qamishli districts reported receiving assistance in the form of smallpox vaccine for their sheep, indicating a gap in support for livestock health and welfare.

The highest form of required support by most of the farmers was the need for feed and fodder across the NES region. This was followed by the need for livestock support, mainly reported by 73% of farmers in Deir-ez-Zor, and finally, the need for equipment/machinery reported by 62% and 53% of the assessed farmers in Deir-ez-Zor and Ar-Raqqa.

## 4.2. Milk collection and aggregation

### 4.2.1. Inputs for Milk Collection

In Northeast Syria, the dairy industry is vital, and milk collection and aggregation are essential for its success. The process involves milk collectors gathering raw milk from small farmers and taking it to a central location for processing and distribution. Of the assessed milk collectors in the NES region, 71% are independent individuals who buy and sell milk, while 26% work at dairy facilities or factories. A small percentage of them work with cooperatives. Milk collectors have a crucial role in ensuring that the milk is safe and of good quality, which is essential for the success of the dairy industry. Their work is essential in supporting the livelihoods of many people in Northeast Syria who depend on the dairy industry for their income.

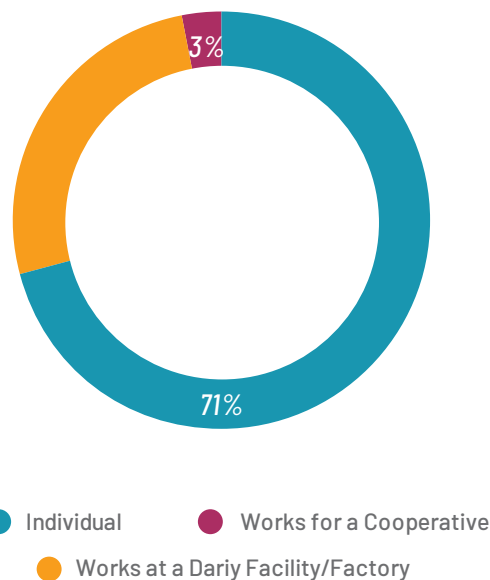


Figure 9: Types of Milk Collectors

Cows' milk is the most collected type of milk, followed by sheep milk. On average, milk collectors gather 550 liters of milk daily, which is sold at an equivalent price of 0.4 USD per liter with a range from 0.2 to 0.6 USD. The milk collectors reported a profit margin of 17.9% per liter.<sup>8</sup>

Around 19% of milk collectors have been in the profession for 10 to 20 years, indicating that it is a long-term job for many individuals. Additionally, half of the milk collectors are new to the profession, having worked for less than 5 years, indicating that this job is attracting newcomers.

### 4.2.2. Sales and Marketing

Milk collectors primarily use small vehicles to transport the milk from producers to retailers, wholesale, and dairy processing units, with only a small percentage selling directly to households. Among the milk collectors surveyed, 76% reported using small vehicles, while only 5% used refrigerated vehicles/trucks. A high volume of their output, approximately 41%, was sold to retailers.

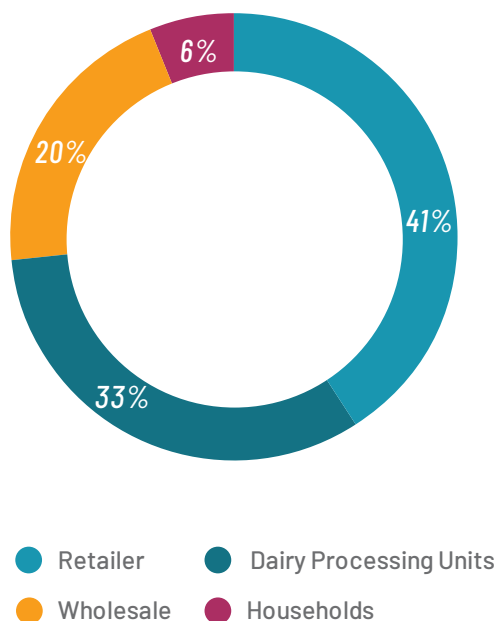


Figure 10: Customers of Milk Collectors.

Health and hygiene were identified as crucial factors in ensuring the safety and quality of milk. To this end, milk collectors reported following several practices to ensure that the milk they collect is free from harmful bacteria and contaminants. One of the most mentioned practices was filtering and pasteurizing the milk, which involved passing the milk through a filter to remove impurities and boiling it to kill any harmful bacteria that may be present.

Milk collectors also stressed the importance of using clean and sealed containers for storing the milk and sterilizing utensils and storage containers to prevent the growth of harmful bacteria. Some milk collectors also mentioned relying on traditional methods, such as a rudimentary examination by smell and taste, which still has its place in some communities.

Milk collectors face various marketing challenges, with 30% of them indicating they are currently facing issues. These challenges include transportation difficulties, irregular sale processes, high prices, lack of storage facilities and electricity, and small transportation vehicles. In addition, high fuel prices and lack of sector support, security laws, market stagnation, and high prices affect their business. Sometimes milk collectors are unable to sell the entire amount of collected milk, and milk spoilage due to hot weather and long periods of milk collection also led to quality deterioration.

A small percentage of the assessed milk collectors (16%) expressed a lack of interest in expanding their business. The reasons cited for this lack of interest include the fact that their current business meets their needs, a lack of demand for expansion, or insufficient funds to invest in business growth.

### 4.2.3. Investments and Growth

Milk collectors face several challenges in their business, including low selling prices, high operational costs, and low quantities of milk per farmer. These challenges make it difficult for them to maintain or expand their business. To overcome these challenges and improve milk production and sales, the collectors identified a range of investments that they would need to make.

The top investments identified by the milk collectors included providing more electricity to keep milk refrigerated for a longer time, investing in refrigerated vehicles for transportation, and investing in sterilization and cooling devices. Financial support, modern equipment, training, and capacity building were also identified as necessary investments. Some collectors highlighted the need for refrigeration and storage equipment, while others suggested expanding their work to include cheese production or expanding their network of milk producers.

The milk collectors also reported that the main competition in their business comes from larger and better-equipped milk collectors. To remain competitive and achieve business growth, they emphasized the need for equipment and machinery and low-interest loans or financial services to overcome their financial barriers for expansion.

### 4.3. Dairy processing

#### 4.3.1. Role of Dairy Processing

Dairy processing is a critical stage in the dairy value chain that transforms raw milk into various value-added products, such as cheese, butter, yogurt, and milk powder. Dairy processing is crucial for creating opportunities for farmers and other actors in the dairy value chain to increase their incomes and improve their livelihoods, in addition to providing consumers with a wider range of dairy products. Many dairy processors have been operating for decades, with some having more than 25 years of experience in the business. Of the assessed dairy processors, 73% reported that their workers were a family member, which indicates that the dairy processing stage is mostly a family business. The number of different suppliers that dairy processors deal with varies, with some processors being small and dealing with less than 3 suppliers, while others deal with 5-15 and some with more than 30.

#### 4.3.2. Dairy Production and Processing Activities

Yogurt and white cheese (cottage cheese) were the most reported dairy products produced, primarily made using cow milk, followed by sheep milk and goat milk. It is worth noting that 29% of the assessed processors use milk produced from their own livestock, and most of them reported that their milk suppliers are local farmers from the surrounding areas.

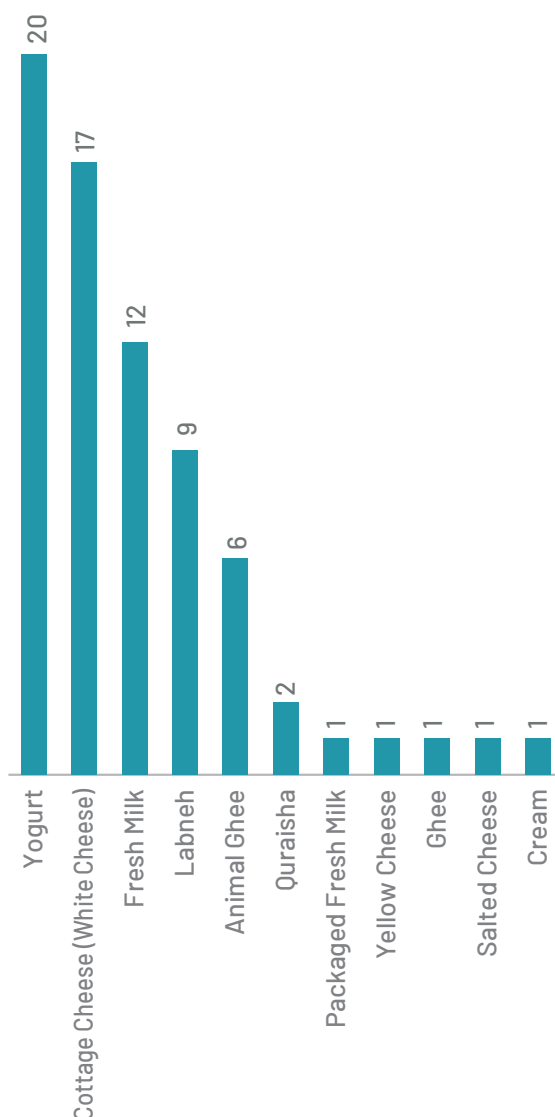
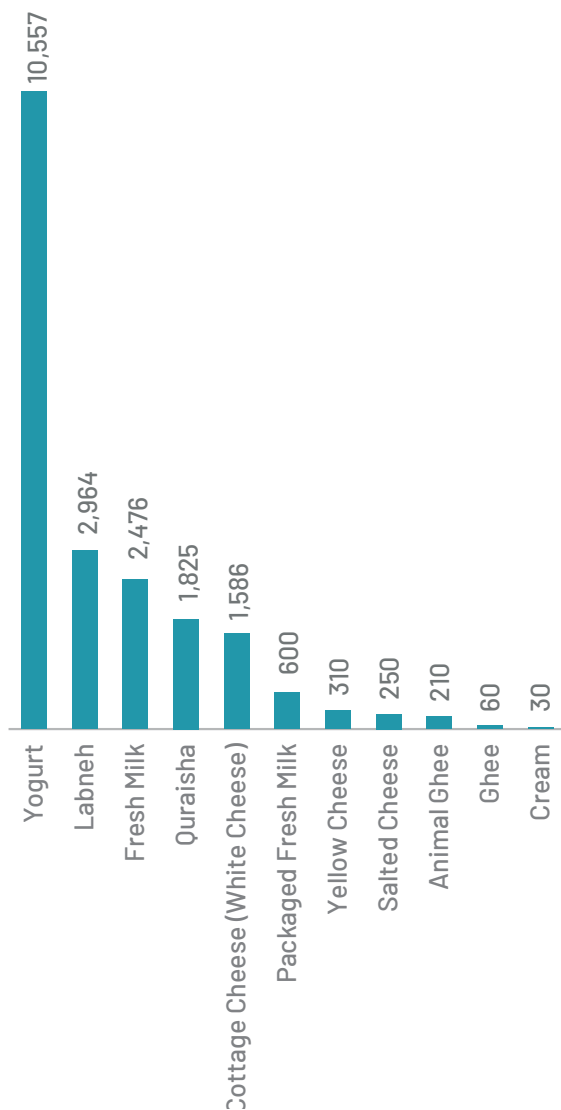


Figure 11: Reported Types of Dairy Products Processed

According to the monthly production data, yogurt is the top dairy product produced, with a monthly average production of 10,557 kg per processor. This shows that there is high demand for yogurt in the market. Labneh is the next most produced dairy product, with an average monthly production of 2,964 kg per processor. Fresh milk also holds a significant position in production, with a monthly average of 2,476 kg per processor. It should be noted that among the different market actors in the dairy value chain, dairy processors had the smallest sample size of 24. Therefore, the production volumes are intended solely to illustrate the variations in demand for dairy products in the market, rather than reflecting the actual production volumes.





**Figure 12:** Average Monthly Production of Dairy Products in Kilograms.

In dairy processing, obtaining a consistent and sufficient supply of milk is crucial for meeting production needs and market demand. However, 21% of the assessed dairy processors (specifically in Al-Hasakeh and Deir-ez-Zor) face challenges in procuring enough milk to meet their production requirements. The reasons cited for these challenges include high costs, inconsistent milk supply, poor milk quality, delays in obtaining milk from suppliers, and difficulties in transporting milk to their processing facilities. These issues can significantly impact the operations of dairy processors and hinder their ability to meet the demand for dairy products in the market. The inconsistent milk supply observed in Al-Hasakeh and Deir-ez-Zor can also be attributed to the reported use of milk producers in these regions to raise sheep and goats as their primary livestock, while having cows and buffalos as the least used animals on their farms.

This imbalance in livestock types directly impacts the quantities and seasonality of milk production. It is worth noting that sheep and goats produce comparatively less milk, and their milk production is more seasonal compared to cows and buffaloes.

In addition to milk, dairy processors may require a variety of other ingredients, including starter cultures, salt, black seed, and corn starch. However, a few dairy processors have expressed challenges in obtaining these ingredients due to their high cost and limited availability in their area. This has resulted in difficulties in sourcing these ingredients and a reliance on a small number of traders who work with these uncommon ingredients.

A notable finding from the survey is that a third of the interviewed dairy processors (33%) reported an increase in the volume of dairy production compared to the same period last year. The dairy processors attributed this increase to a range of factors, such as having more customers and better access to production inputs. Interestingly, those dairy processors who produce their own milk indicated that the increase in production was due to rainfall, highlighting its positive impact on the growth of fodder or the improvement of grazing lands. On the other hand, some dairy processors reported a decrease in the volume of dairy products compared to the same period last year. These processors indicated that the primary reason for the decrease was the increased costs of production.

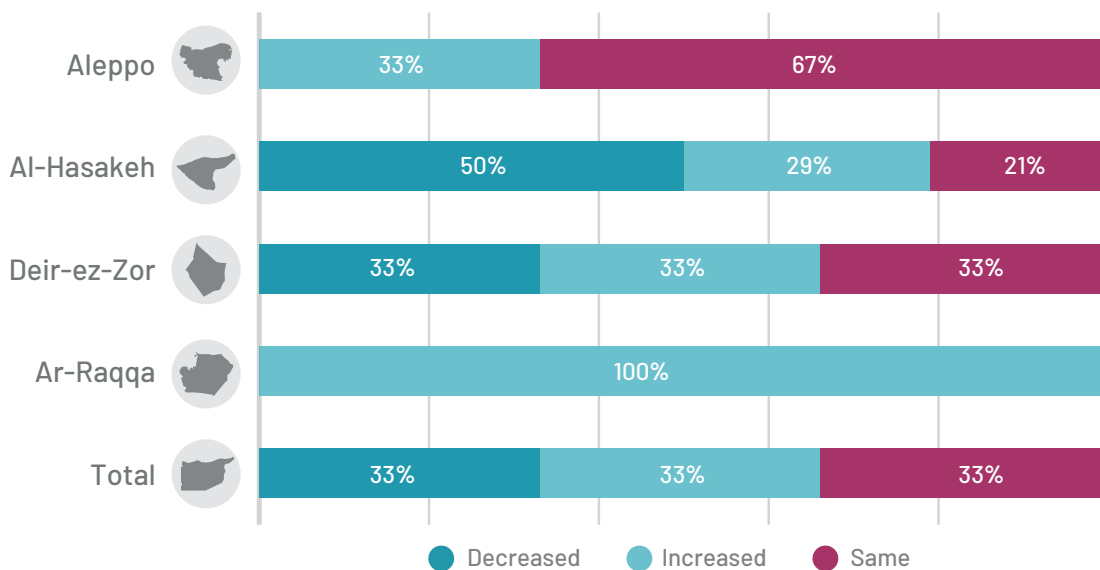
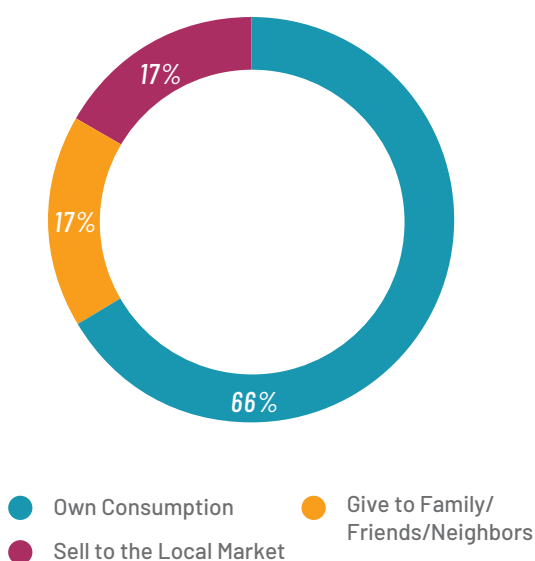


Figure 13: Dairy Production Volume Changes - 2022 vs 2023

In terms of sales, 66% of produced dairy products were sold to the local market, while 34% was either consumed by the dairy processors themselves or shared with their acquaintances. To store their products, dairy processors use a variety of refrigeration methods, including iceboxes, coolers, cool rooms without electricity, and electricity-based methods such as the public electricity network or private generators. The most reported refrigeration method was electricity-based using private generators.

However, despite the widespread use of private generators and its impact on the production cost, half of the dairy producers reported experiencing fair or very poor reliability on their refrigeration source. This could be attributed to the instability of the electricity supply and a lack of availability of fuel for generators, which can hinder the effectiveness of refrigeration and compromise the quality of dairy products.

When it comes to dairy product production, dairy processors face several challenges. The most pressing issue is the cost of production, which was reported by many producers. Additionally, low selling prices and transportation availability were cited as significant obstacles. Time limitations were also mentioned as a challenge, including a lack of time for milk collection, product and equipment mobility, marketing, receiving imported items, exporting, and providing workforce. These challenges can significantly impact dairy processors' efficiency and productivity, ultimately affecting the volume and quality of the dairy products they produce.



The median monthly cost of operating a dairy processing facility is approximately 400 US dollars, with operating costs ranging from a minimum of 150 to a maximum of 35,000 USD. These costs encompass labor, equipment maintenance, and utility bills, among other expenses. Given the challenges faced by dairy processors in terms of production costs and low selling prices, operational costs can further strain the profitability of the dairy processors.

Figure 14: Percentage of Dairy Products Utilization

### 4.3.3. Quality Control Practices in Dairy Processing

Many of the assessed dairy processors (42%) actively perform quality checks on their dairy products before consuming or selling them. These quality checks play a vital role in ensuring that the dairy products meet the required standards and are safe for consumption. The processors conduct various tests to ensure product quality, including checking for bacterial contamination in the milk, examining for any unusual odors or flavors, and assessing the fat content of the milk.

The fact that nearly half of the dairy processors are engaged in such quality checks is a positive indication of their commitment to delivering high-quality products to the market, maintaining safety standards, and providing consumers with reliable and satisfactory dairy products.

### 4.3.4. Sales and Marketing

When it comes to selling dairy products in the local market, most dairy processors sell their products to retailers' shops. Retailers hold the largest market share and act as the primary sellers of dairy products. They play a crucial role in connecting consumers with these products. Wholesalers also have a significant presence, serving as intermediaries between dairy processors and retailers.

Interestingly, only a small portion of dairy products are sold directly to consumers, representing less than a quarter of the total market. This indicates that consumers mainly rely on retailers for purchasing their dairy products. It is important to note that the currency used for these transactions is the Syrian Pound (SYP).

The yogurt market has experienced remarkable growth and is now considered the fastest-growing product in the dairy industry. Nearly all dairy processors have reported a significant increase in demand for yogurt, highlighting its popularity among consumers.

When analyzing the prices of different dairy products across various types of buyers, variations in typical prices per kilogram are observed. As shown in Table 1 below, for most dairy products, the average prices per kilogram remain relatively consistent across different buyer categories.

However, specific products like labneh, cottage cheese, animal ghee, and salted cheese show distinct pricing differences.

Furthermore, it can be noted that dairy processors tend to prefer wholesalers as their primary buyers. This preference can be attributed to the benefits they offer, including their ability to purchase in large quantities and provide immediate cash payments.

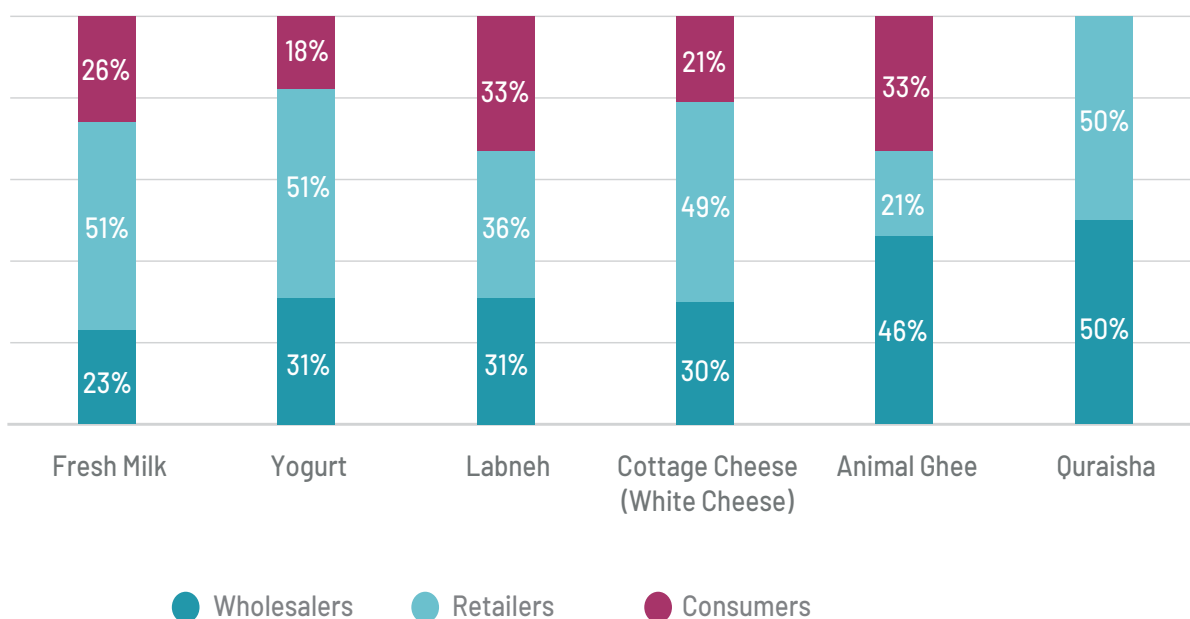


Figure 15: Dairy Products Utilization per Customer Type

**Table 1:** Price Analysis of Dairy Products: Maximum, Minimum, and Average Prices per Product per Customer Type

	Wholesalers			Retailers			Consumers		
	Min	Average	Max	Min	Average	Max	Min	Average	Max
<b>Fresh milk</b>	\$0.22	\$0.28	\$0.40	\$0.20	\$0.30	\$0.46	\$0.21	\$0.44	\$0.60
<b>Packaged fresh milk</b>	N/A	N/A	N/A	N/A	N/A	N/A	\$0.50	\$0.50	\$0.50
<b>yogurt</b>	\$0.24	\$0.52	\$0.89	\$0.22	\$0.50	\$0.50	\$0.24	\$0.58	\$0.80
<b>Labneh</b>	\$0.90	\$1.07	\$1.30	\$0.60	\$0.94	\$1.14	\$0.55	\$1.15	\$2.00
<b>Cottage cheese (white cheese)</b>	\$2.00	\$5.11	\$13.00	\$1.90	\$3.13	\$5.90	\$1.50	\$2.83	\$5.00
<b>Yellow cheese</b>	N/A	N/A	N/A	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<b>Animal ghee</b>	\$5.00	\$10.33	\$20.00	\$3.33	\$4.42	\$5.50	\$6.00	\$8.00	\$10.00
<b>Salted cheese</b>	\$5.20	\$5.20	\$5.20	\$5.50	\$5.50	\$5.50	N/A	N/A	N/A
<b>Quraisha</b>	\$9.00	\$9.00	\$9.00	\$1.00	\$1.00	\$1.00	N/A	N/A	N/A
<b>Cream</b>	N/A	N/A	N/A	\$2.00	\$2.00	\$2.00	N/A	N/A	N/A
<b>Ghee</b>	N/A	N/A	N/A	\$7.00	\$7.00	\$7.00	N/A	N/A	N/A

Dairy processors commonly determine the selling price of their products by considering various market factors, including supply and demand dynamics, production costs, and prevailing market prices. Additionally, pricing decisions may also be influenced by agreements between dairy processors and the buyers, such as wholesalers and retailers, and factors related to product quality, with higher-quality products having higher prices due to factors such as taste, freshness and production processes. However, despite considering these factors, 58% of the dairy processors expressed their dissatisfaction with the current selling price of their dairy products and classified the selling prices as unfair.

Dairy processors have identified three key factors that they believe are essential for obtaining better prices for their products. Firstly, 50% of respondents consider increasing their production/sales volume to be a significant factor in improving pricing outcomes. By having the ability to increase production volumes, the processor can leverage the opportunity to supply wholesalers with larger quantities of products, thereby attaining a potentially satisfactory price. Secondly, 43% of processors emphasize the importance of improving the quality of their products. They believe that higher-quality products can potentially have higher prices in the market. Lastly, 29% of respondents express a strong desire to expand their product's advertising reach. They believe that wider advertising can help create more demand and increase the perceived value of their products, ultimately leading to better pricing opportunities.

Dairy processors have different levels of profit margins for their businesses, ranging from 5% to 40%, with the majority being between 10% and 30%. When asked about their sales compared to the same time last year, 33% of processors reported that their sales decreased. Processors attributed the decline in sales to the increased product selling prices, hence being unaffordable to consumers, as well as financial constraints and high input costs.

Those which are also involved in milk production additionally emphasized factors such as insufficient and expensive animal feed, reduced rainfall levels, restricted access to pastures, and a low livestock population.

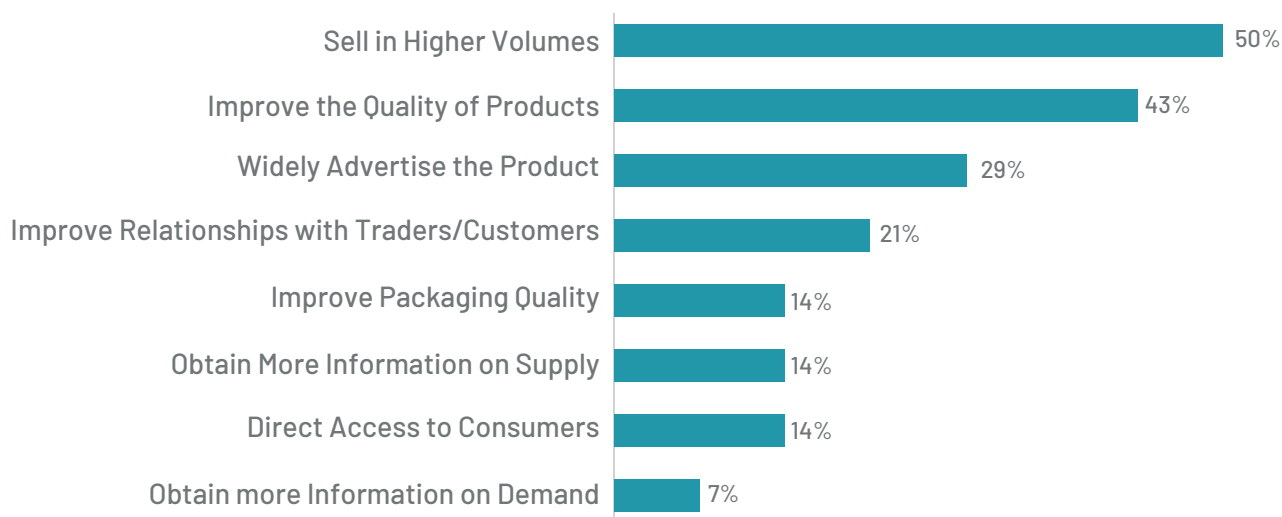


Figure 16: Potential Selling Strategies to Increase Profit

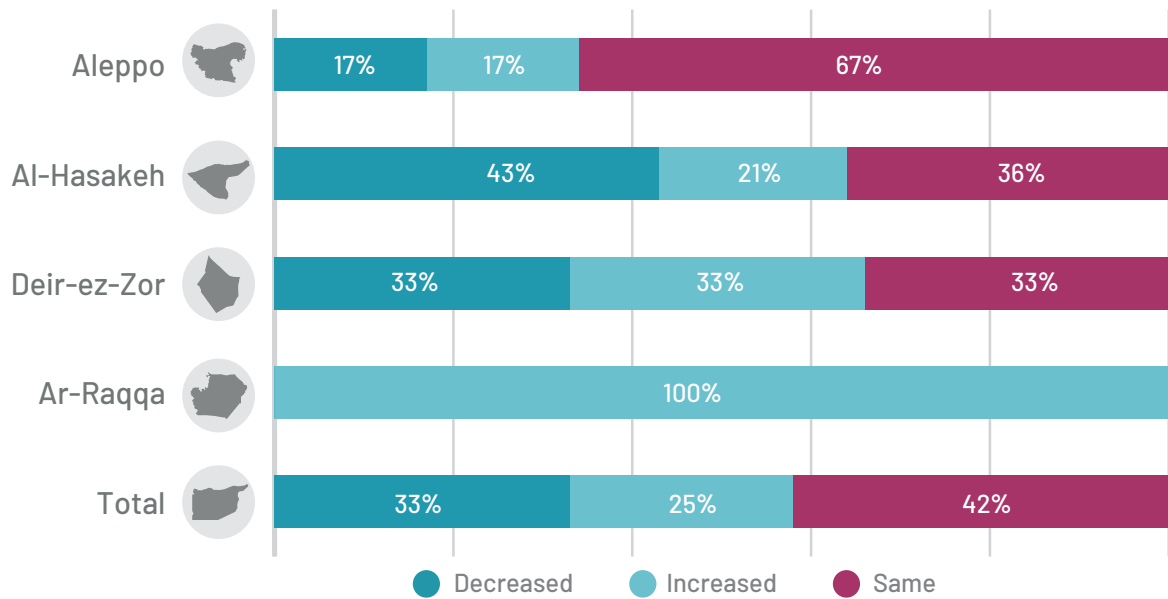


Figure 17: Dairy Products Sales Changes - 2022 vs 2023

When it comes to how dairy processors sell their products, 58% reported customer pickup from manufacturing areas, while 33% reported offering delivery services directly to the buyers. As for product transportation, a large majority of 83% use vehicles that do not have refrigeration. Only 8% use vehicles that have special refrigeration powered by electricity, and just 4% use vehicles that have ice or non-electric cooling systems. Dairy processors use two different types of packaging for their products: one for individual use, like plastic bags, bottles, or small buckets, and another for bulk use, such as plastic or metal drums and large buckets. It is crucial to highlight that only 8% of processors include an expiration date label on their products, while the rest did not report using any labels.

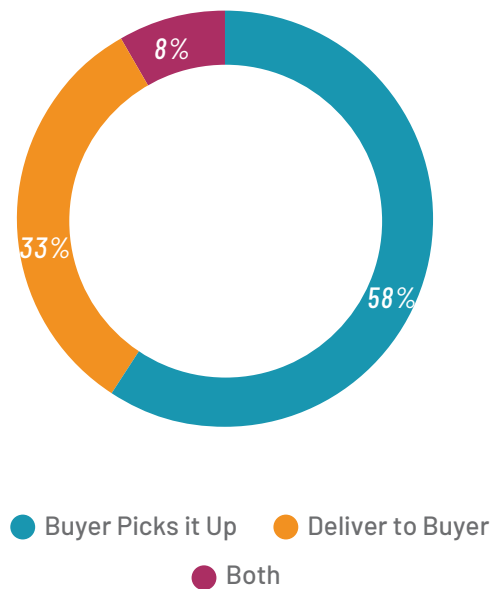


Figure 18: Dairy Products Delivery Methods

Out of the dairy processors surveyed, 42% mentioned that sometimes they end up with extra dairy products that they cannot sell. The reasons for having these surplus products varied. Some processors said it was because of security concerns, which affected the demand for their products. Others mentioned that high prices, and obstacles in the buying process led to lower demand. Some processors also attributed the surplus to seasonality, where production volumes in the Spring season are usually higher than the market demand. Weather and road conditions were also mentioned as factors that can contribute to having surplus products, due to the imposed accessibility limitations.

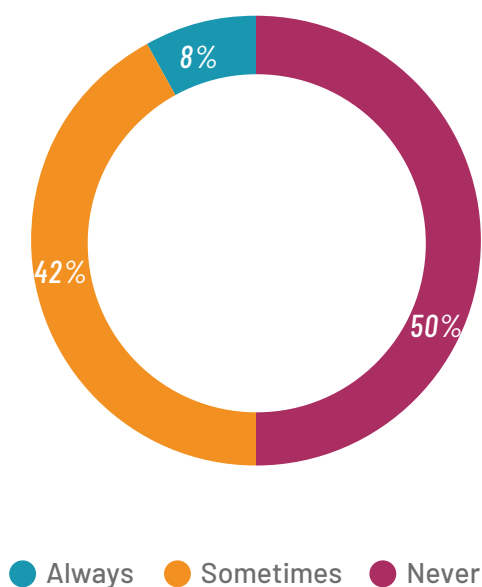


Figure 19: Frequency of Dairy Products Surplus

Dairy processors face various marketing challenges that affect different aspects of their business. The main challenges that were identified involved financial constraints, significant discrepancies between production costs and sales prices, limited market access, and challenges in implementing effective marketing strategies. These challenges were mainly caused by the increased prices and occasional limited accessibility to production inputs, particularly fuel, which consequently impacted transportation costs. Additionally, the reliance on intermediaries hindered the establishment of direct relationships with buyers. This limited market access was also affected by import competition, and difficulties in advertising and marketing.

#### 4.3.5. Investment and Growth

When it comes to expanding and growing their businesses, 46% of the assessed dairy processors expressed interest and have concrete plans in place for expansion. Another 25% expressed interest in expansion but currently lack specific plans. On the other hand, some processors indicate either no interest or uncertainty in expanding their businesses. The main reasons cited for not being interested in expansion were the lack of financial resources needed for expansion, unavailability of necessary inputs like livestock and fodder, and the belief that the current size of their business meets their needs.

Dairy processors mentioned three important investments to improve their dairy production and sales. Firstly, those which are also involved in milk production want to improve the quality of fodder and increase the number of livestock they have, which would help them produce better milk and dairy products. Secondly, they want to buy modern equipment and cooling devices to improve their production process and keep their products fresh for longer periods. Lastly, they need financial support to invest in resources and expand their operations. With these investments, they hope to produce better dairy products and expand their customer base.

When asked about the top priorities for improving their businesses, dairy processors provided valuable insights. The most crucial factor identified by 79% of respondents is the need for better access to financial services or loans to operate their businesses. This highlights the significance of financial support in overcoming operational challenges and expanding their operations. Access to new equipment and machinery was identified by 67% of processors, emphasizing the importance of modernizing their production processes. Additionally, 58% emphasized the need for better access to electricity, water, or fuel, which are essential resources for dairy production. Improving transportation or road networks was mentioned by 29% of processors, as it plays a vital role in facilitating the distribution of dairy products. Finally, 25% expressed the importance of establishing better relationships with traders in local markets, highlighting the value of strong business networks.

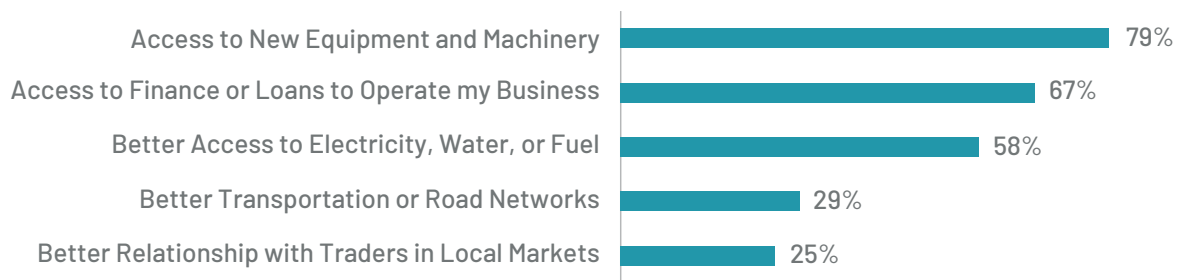


Figure 20: Key Factors for Business Improvement

## 4.4. Retail and wholesale

Wholesalers and retailers play crucial roles in the dairy value chain in Northeast Syria (NES), facilitating the efficient flow of dairy products from producers to consumers. Wholesalers act as intermediaries between dairy processors and retailers, responsible for purchasing large quantities of dairy products and distributing them to retailers across the region. Additionally, consumers occasionally engage directly with wholesalers to purchase dairy products. On the other hand, retailers are the final link in the chain, connecting directly with consumers by offering a diverse range of dairy products through various sales outlets such as supermarkets, grocery stores, and local markets.

Within this assessment, four wholesalers and 36 retailers were interviewed. Among these retailers, the majority (31 retailers) are grocery stores or “dukkan”, small local shops where people can find a variety of items including dairy products, and five dairy-specific retailers selling exclusively dairy products.

### 4.4.1. Retailers and Wholesalers Input Supplies

When it comes to the gender distribution among workers in the dairy value chain, the available data indicates a prevalence of male workers in dairy wholesale sector. Specifically, it has been reported that only male workers are involved in wholesale operations. Furthermore, among the workers reported in the retail segment, a majority of 88% are men. These numbers indicate gender imbalance, with women’s involvement in these specific areas being limited.

Wholesalers and retailers are responsible for the distribution and sale of a diverse range of dairy products, with a particular focus on fresh milk, yogurt, labneh, and cottage cheese (white cheese). These products have emerged as the most frequently produced items by dairy processors, indicating a significant demand for them among consumers.

The wholesalers and retailers trade in both imported and locally produced dairy products. As shown in figure 21, most dairy products are locally produced, indicating a strong reliance on domestic sources. Yogurt is exclusively sourced from local suppliers, followed by Labneh (98%), Fresh milk (93%), and cottage cheese (81%). Other dairy products such as ghee, processed cheese, and packaged fresh milk were mainly imported.



## Milk and Dairy Products Value Chain Assessment in Northeast Syria

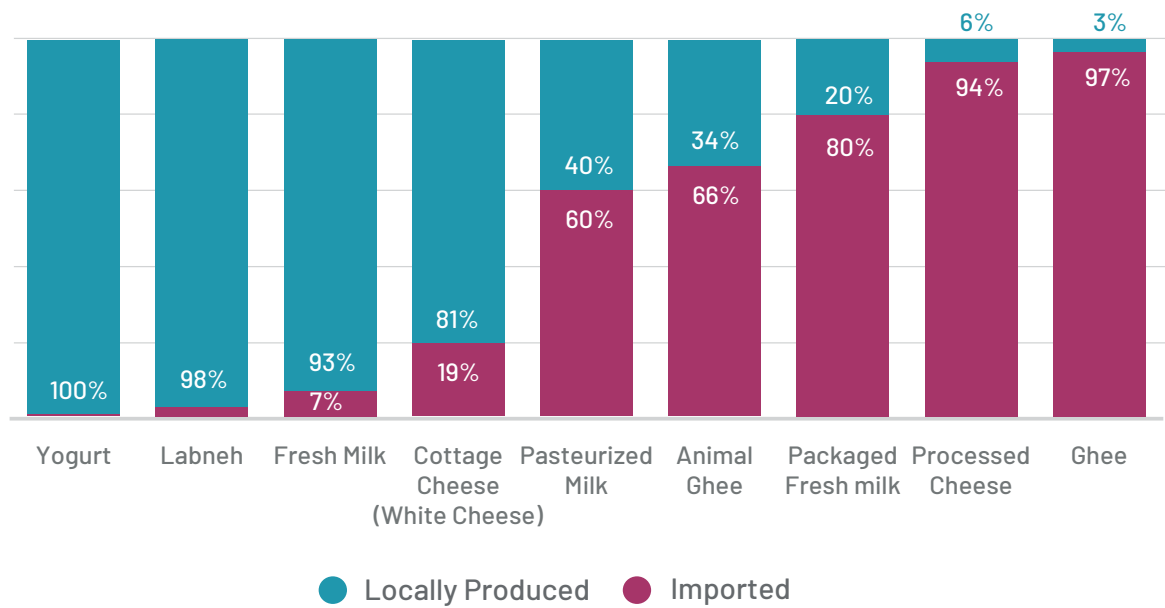


Figure 21: Local vs Imported Dairy Products

Dairy wholesalers in NES import dairy products mainly from Iraq and Turkey. Imported products are reported to be procured from importers located within NES, or manufacturing facilities from the countries of import. As for locally produced dairy

products, they are sourced from multiple suppliers. These suppliers include local farmers, cooperatives, or associations, as well as traders and wholesalers who get the product from local farmers.

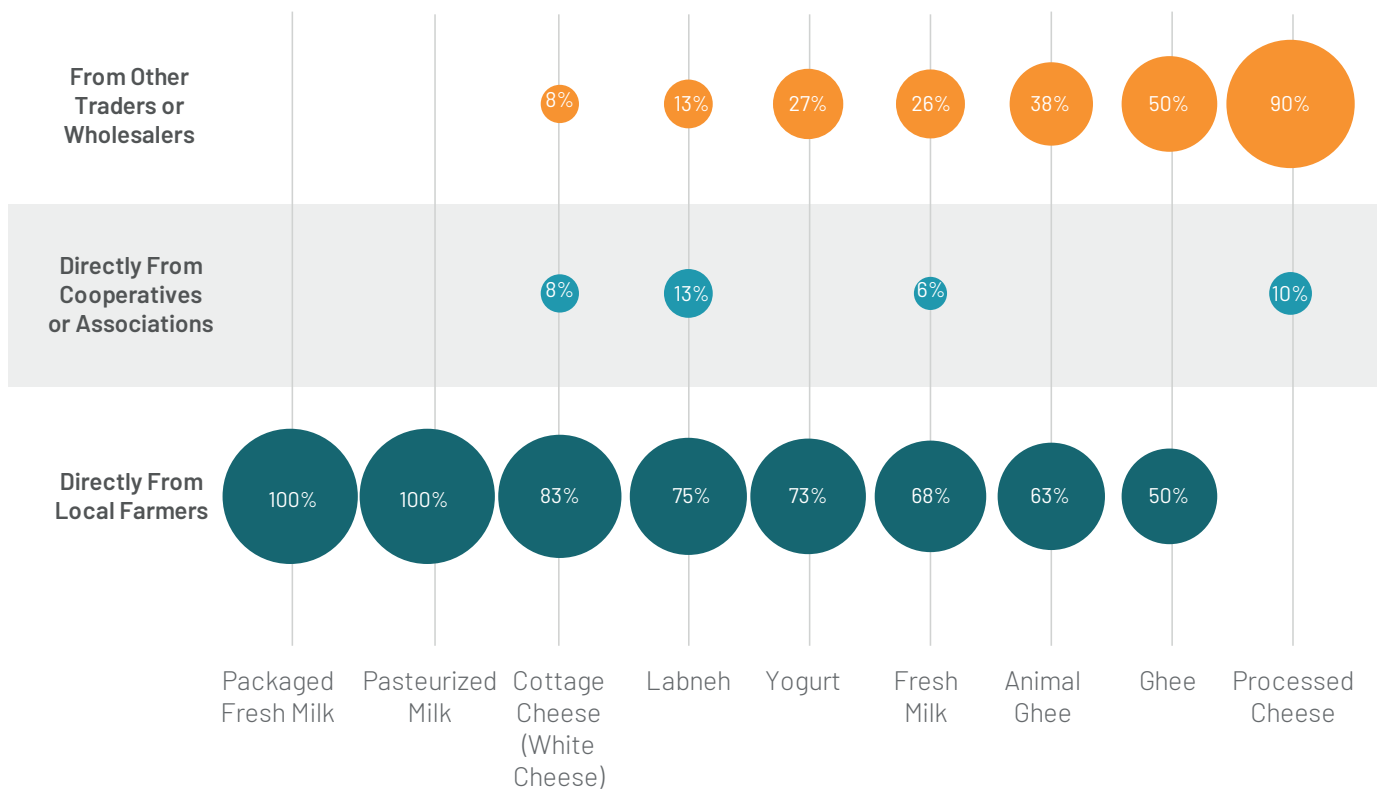
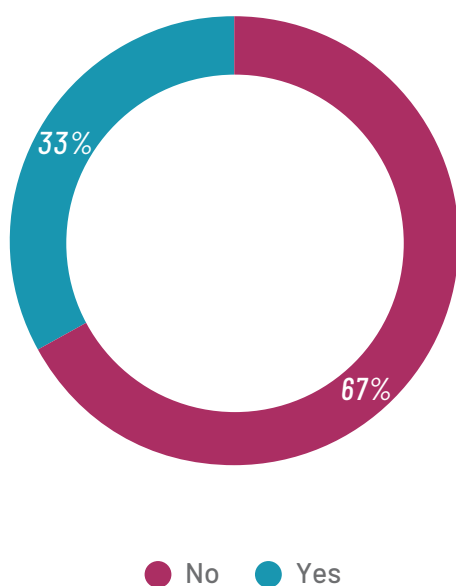
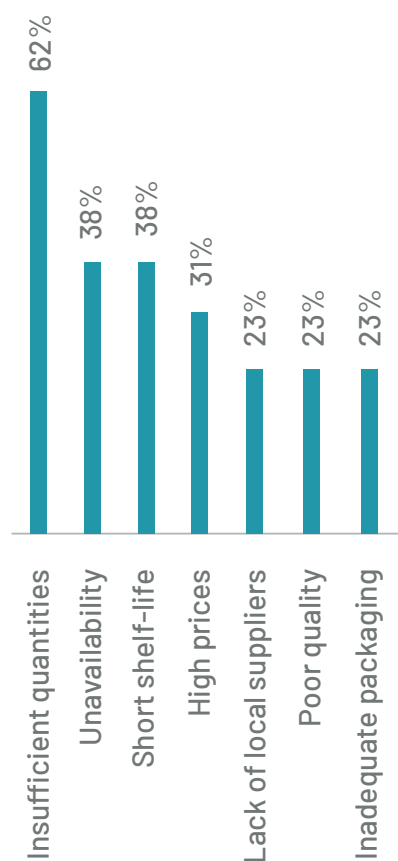


Figure 22: Suppliers of Dairy Product Traders



**Figure 23:** Percentage of Retailers Engaged in Trade with Imported Dairy Products.

The primary suppliers for dairy retailers include local farmers and local dairy processors, alongside them are wholesalers who collaborate with local farmers. However, dairy retailers face several challenges, with 62% of the assessed retailers reporting low production quantities as the main challenge. This shortage can lead to supply gaps, making it difficult for retailers to meet local demands. Another significant challenge faced by retailers is the storage limitations for local dairy products with a short shelf life. Dairy products that are not shelf-stable, such as fresh milk, cheese, and other perishable items require refrigeration or specific temperature-controlled environments to maintain their freshness and quality are considered a major challenge for most retailers.



**Figure 24:** Local Products Retailing Challenges

A high number of the dairy retailers have expressed their inability to source locally produced products and keep up with the local demand mainly due to two reasons. First, low milk production due to animal destocking or malnutrition caused by the lack of feed and fodder. Second, the demand for certain dairy products fluctuates throughout the year. During specific seasons, the demand for these products gets very high, and there are not sufficient quantities available to meet the demand.

Retailers indicated that the local products are more popular than imported ones. In fact, consumers prefer local products and only rely on imported ones when local options are scarce or during the off season. Even more, local consumers praise local products for their freshness, lack of preservatives, and competitive prices compared to imported products.

#### 4.4.2. Quality Control Practices for Retailers and Wholesalers.

Effective quality control practices are vital for retailers and wholesalers in the dairy value chain to maintain the integrity, safety, and customer satisfaction of dairy products. According to all the retailers, the products they offer require refrigeration. Most of these retailers employ electric-based refrigeration methods, with the community generator being the most frequently utilized source, as depicted in figure 25. A significant proportion of retailers also rely on public electricity networks and private generators. However, only 36% of the

retailers can rely on their refrigeration source. It is worth noting that power cuts can also disrupt the consistency of refrigeration periods, further compromising the quality and safety of dairy products.

When it comes to the quality tests conducted by retailers before selling dairy products only 53% of the assessed retailers (18 retailers) undertake them. In the case of wholesalers, 3 out of the 4 interviewed wholesalers indicated that they also perform quality tests on their products.

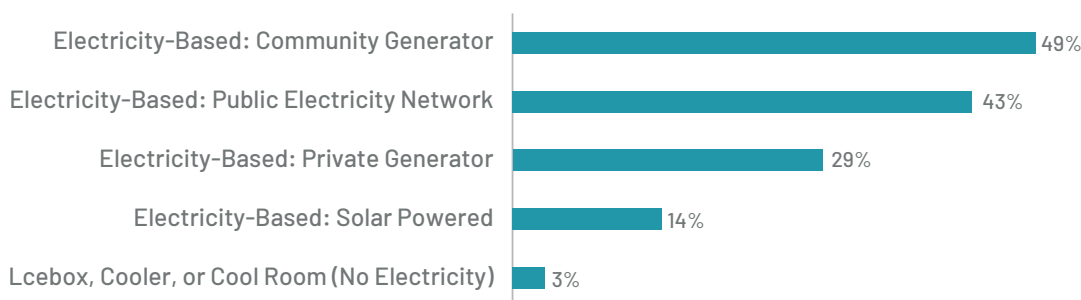


Figure 25: Types of Refrigeration Methods

#### 4.4.3. Sales and Marketing

In terms of distribution of dairy products, wholesalers supply these products to other wholesalers, retailers, and most notably directly to consumers, where their selling currency was mainly Syrian Pound (SYP). Through their market insights,

the retailers have identified yogurt, fresh milk, and cottage cheese (white cheese) as the dairy products with the highest consumer demand and in turn have the highest monthly sales volumes as shown in figure 26.

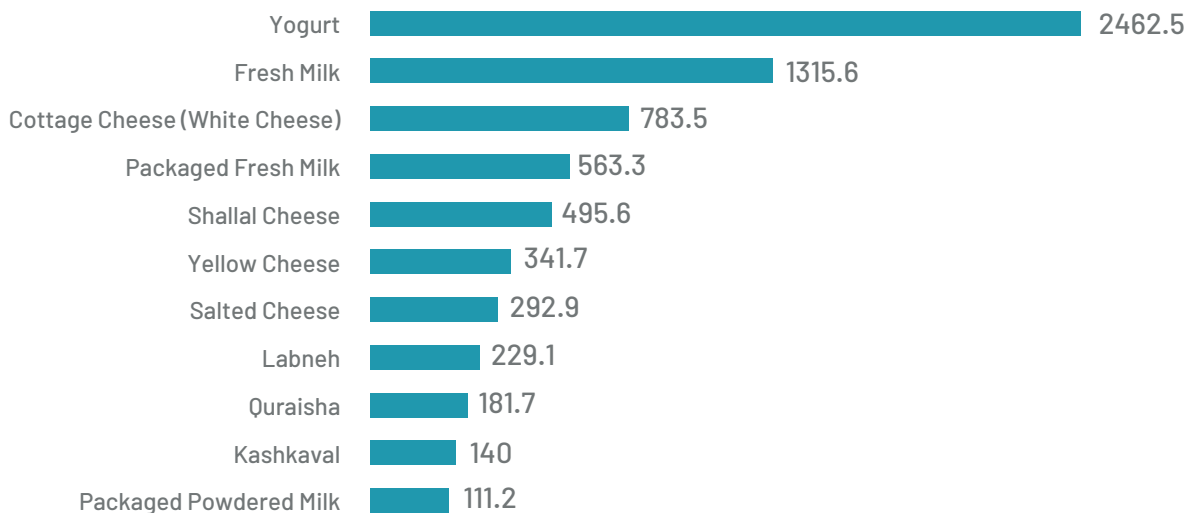


Figure 26: Retailers Monthly Sales Volume of Dairy Products in Kilograms.

Among retailers, it was found that 53% reported a decline in sales compared to the same period last year, while only 19% reported an increase. Retailers attributed the decrease in sales of dairy products to several factors including: high prices, low per capita income, a high dollar exchange rate, low quality products, insufficient availability of local products, and the high cost of livestock feed leading to decreased milk quantities.

#### 4.4.4. Investment and Growth

When considering purchasing dairy products from new suppliers, retailers and wholesalers unanimously prioritize two key factors: product quality and cost. These aspects are deemed crucial in their decision-making process. Moreover,

As for the access to information about other suppliers, producers, and buyers in the market, details on pricing, supply, and demand, only 25% of the retailers stated that they have no access to such information. Retailers reported gathering this information through direct communication with individuals in the local community, such as relatives, neighbors, and customers, as well as through local market observations.

wholesalers highlighted the significance of low transportation costs as an additional factor influencing their choice of suppliers.

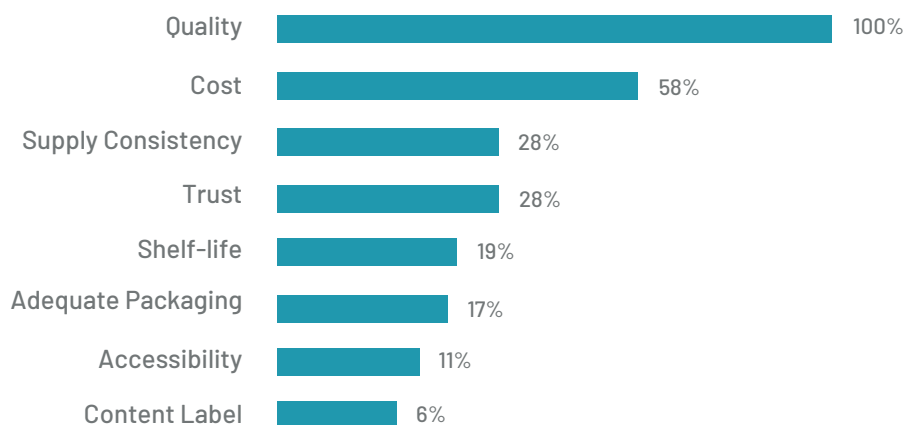


Figure 27: Suppliers Evaluation Factors

When it comes to expanding and growing their businesses, 36% of retailers expressed interest and have concrete plans in place for expansion. Another 47% expressed interest in expansion but currently lack specific plans. However, some retailers indicated either no interest or uncertainty in expanding their businesses. The main reasons cited for not being interested in expansion were the lack of financial resources needed for expansion. The wholesalers indicate that better access to electricity, water, fuel, new equipment, and financial support or loans are the most important elements to improve their business.

## 4.5. Consumption

Consumers play a pivotal role in the dairy value chain as the ultimate recipients of dairy products, driving demand, and influencing the entire industry through their preferences and purchasing decisions.

### 4.5.1. Consumption Levels, Demand, Preferences

Yogurt, fresh milk, labneh, and cottage cheese (white cheese) are considered highly popular dairy products that have widespread consumer consumption. According to Figure 28, yogurt is consumed by 90% of the interviewed consumers, while cottage cheese is consumed by 53% and labneh by 47%.

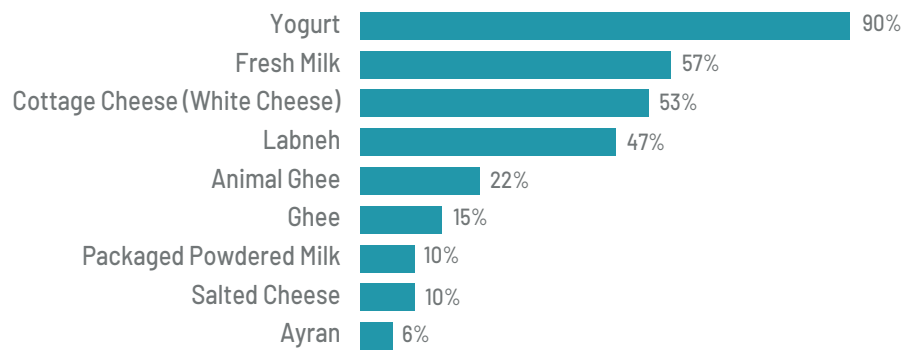


Figure 28: Dairy Product Consumption per Household

According to households, 92% of the interviewed households consider retailers or grocery stores as the primary source for purchasing dairy products. Figure 29 provides insight into the sources from which different dairy products are purchased. Most dairy products, such as packaged fresh milk, yellow cheese, cream, halawet el jibn, and ice cream, are exclusively obtained from grocery stores or retailers. However, there is a

notable percentage of consumers, ranging from 7% to 50%, who prefer to buy certain products like fresh milk, packaged powdered milk, yogurt, labneh, cottage cheese, processed cheese, ghee, animal ghee, kashk, salted cheese, ayran, and quraisha, directly from farmers or producers. Additionally, a smaller percentage of individuals rely on family or community members and traders as sources for specific dairy products.

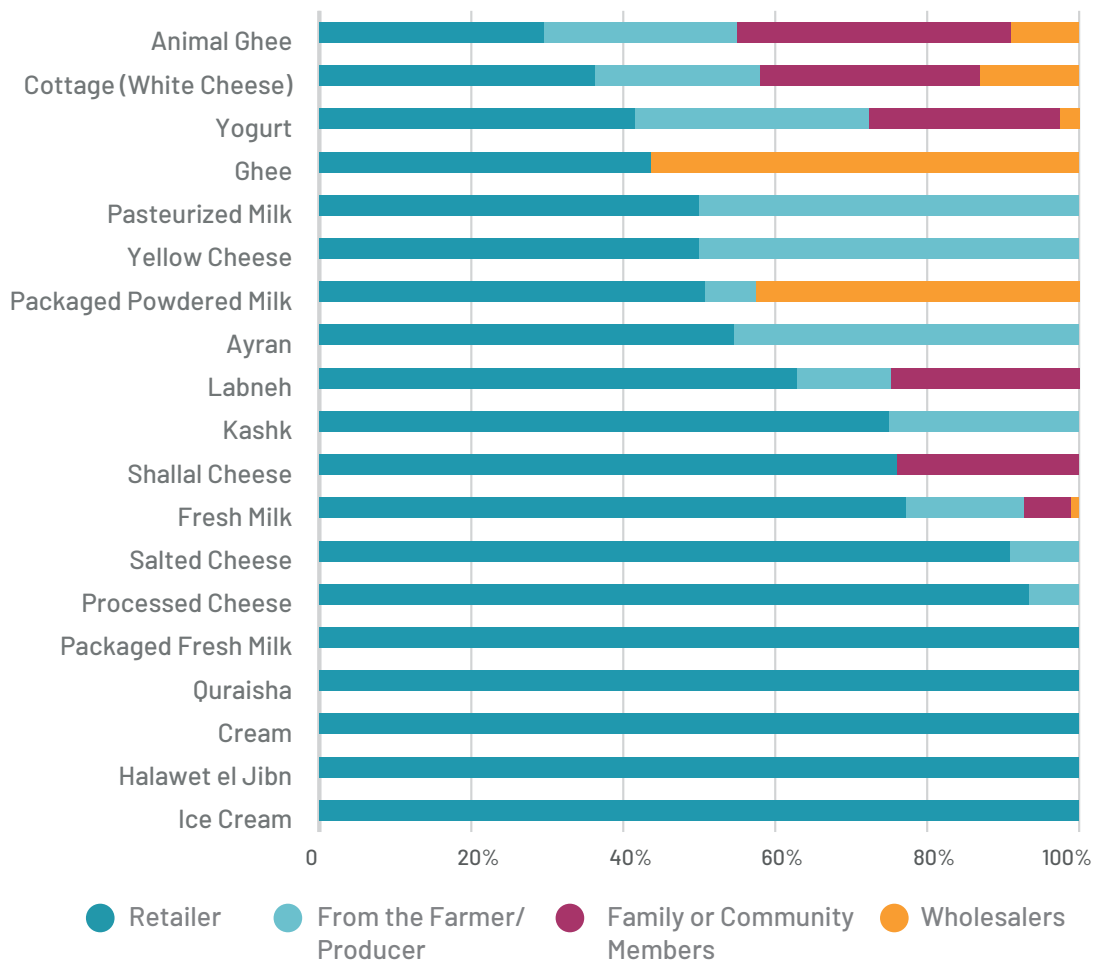


Figure 29: Consumers Dairy Products Sources

Regarding the availability of the product in the local markets, figure 30 shows that fresh milk, yogurt, labneh, and cottage cheese were the most frequently found products in local markets. Their availability varied from consistently available

to moderately available. On the other hand, ghee and animal ghee had a higher percentage of unavailability, ranging from 10% to 15%. This can be explained by the fact that these products are often imported, as reported by traders.

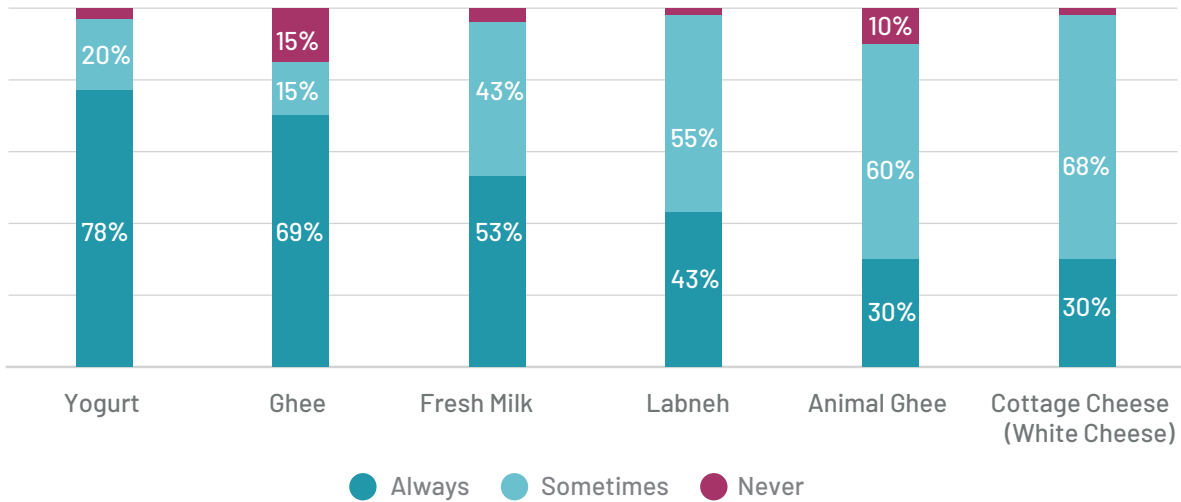


Figure 30: Consumers Reported Dairy Products' Availability

Across NES, 12% of the interviewed households always find it possible to purchase their needs of the products, while 9% never have that opportunity. The majority of respondents, 79%, reported that they sometimes face limitations in buying the amounts they require. In terms of individual governorates, all the respondents in Aleppo governorate reported facing limitations, while Al-Hasakeh, Ar-Raqqa, and Deir-ez-Zor have varying percentages experiencing occasional limitations. The main reasons for these limitations are the unavailability of certain products, such as Kashkaval, cream, Halloumi, Animal ghee, and shallal cheese, as well as the unaffordability of some products, such as cottage cheese (white cheese), animal ghee, cream and kashkaval. Importantly, the majority of consumer households show a preference for local products due to their perceived quality, natural ingredients, lower cost compared to imports, and trust in the source. These factors also influence the customers purchasing decisions.

Consumers expressed their desire to see certain dairy products in the market, including pasteurized milk, cream, canned yogurt, animal ghee, kashkaval cheese, and various low fat milk products. Additionally, there is a demand for spreadable cheese, Halloumi cheese, and flavored yogurt. The inclusion of animal ghee, processed cheese, and traditional cheese varieties like shanklish and mozzarella is also desired.

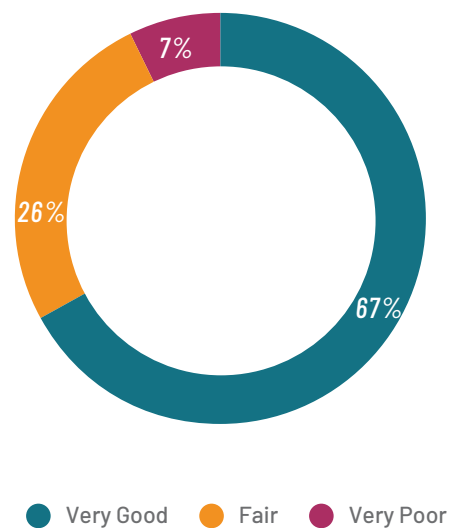


Figure 31: Consumer Perception of Dairy Product Quality

Most consumers in the area rated the quality of dairy products positively, with 67% rating as good. Only a small percentage of respondents, 7%, considered the quality to be poor. Overall, the feedback indicates that the quality of dairy products in the area is generally satisfactory.

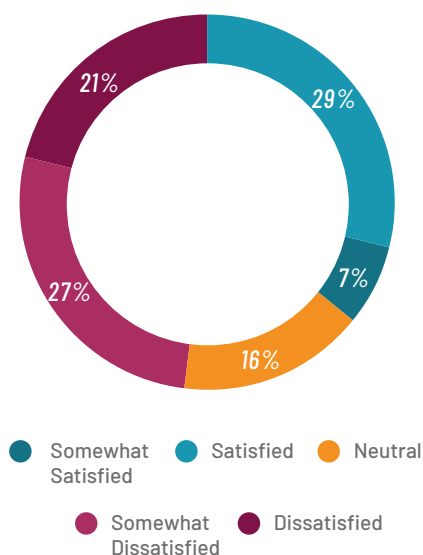


Figure 32: Satisfaction Levels of Consumers with Dairy Products in the Area.

## 4.6. Local Authorities

To gather comprehensive information about the value chain in NES governorate, partners engaged in discussion with seven local authorities. These discussions provided valuable insights into the current state of milk and dairy production. The goal was to understand the challenges faced, opportunities available, and how these facilities can be improved.

### 4.6.1. Challenges Affecting Milk and Dairy Production in the Area

Based on the interviews with representatives of the local authorities, the milk and dairy value chain in Northeast Syria (NES) is currently facing numerous challenges. One of the primary obstacles is the adverse effects of climate conditions, which have led to prolonged periods of drought in recent years. This, in turn, has resulted in a shortage of pastures and feed, severely impacting the livestock population in the region. To mitigate the scarcity of feed and fodder, farmers are compelled to reduce the number of animals they rear.

In addition to the challenges posed by climate conditions, farmers in NES also face difficulties in accessing essential medicines and vaccines for their livestock. The conflict in the region has led to a dramatic reduction in veterinary services and support, making it increasingly challenging for farmers to procure veterinary drugs. Moreover, the limited availability of these drugs in local markets, coupled with their inflated prices and compromised quality, exacerbates the situation.

The income of dairy farmers is further affected by the influence traders have on milk prices. Farmers often find themselves at a disadvantage as traders exploit their vulnerability and manipulate prices. Due to insufficient production and storage capacities, farmers are compelled to accept lower prices for their milk rather than risk wastage. Traders take advantage of this situation, pushing down milk prices while increasing their own profit margins.

Consequently, the local milk production in NES has been steadily declining, significantly impacting the overall dairy production in the region. To meet the market demand and compensate for the shortfall in local milk quantities and quality, an increasing number of dairy producers are relying on imported powdered milk.

The combined impact of these challenges has had a profound effect on the livelihoods of farmers and the dairy industry in NES. Farmers and dairy producers struggle to cope with the shocks of climate conditions and economic instability, making it increasingly difficult for them to sustain their operations.

#### 4.6.2. Current Opportunities in Milk and Dairy Production

Even though many challenges are faced, representatives of the local authorities cited several opportunities to support the milk and dairy products value chain. Direct support to farmers and breeders including feed and fodder, medication, vaccines, and equipment can significantly increase production quantities and quality.

Moreover, local authorities emphasized the necessity of capacitating veterinary technicians through training and modern equipment. Such support will significantly increase the efficiency of their interventions and widen their coverage specter. Training courses are currently being conducted for both technicians and breeders yet wider interventions are required.

Efforts are also underway to restore vegetation cover and natural reserves including cultivating forage crops, establishing small-scale dairy and cheese production workshops, and supporting medium-sized laboratories with improved equipment. Rehabilitation of desert wells for livestock watering, and breeders support who have lost their livelihoods by providing productive livestock is also ongoing in parallel.

Furthermore, additional efforts are being made to facilitate the production, preservation, and secure transportation of dairy products to the market. Comprehensive livestock surveys are being conducted to assess the real situation of animal wealth in the region. These opportunities, coupled with favorable factors like increased rainfall and reliance on grazing, are expected to result in higher milk production and potential export possibilities.

In the context of Al-Raqqa governorate in the NES region, the current situation presents limited opportunities for assistance and intervention in the milk and dairy production value chain. Support is primarily provided through subsidized feed and fodder. However, there is a lack of available opportunities due to the absence of dairy and cheese factories, as well as the absence of farms for livestock production and breeding. It is worth noting that there are private-sector milk and dairy factories near Al-Sabahiya checkpoint, specifically for cheese production, but there is no entity affiliated with the self-administration that offers such facilities.

#### 4.6.3. Management Support for Improving Milk and Dairy Production

As local authorities, several interventions are currently managed to support and improve milk and dairy production in different regions. In Deir-Ez-Zor governorate, the focus is on addressing challenges in nutrition and veterinary health. Steps to support and improve production include providing quality feed at affordable prices, promoting the cultivation of forage crops and green fodder, protecting grazing areas, supplying vaccines and veterinary medicines, improving technical expertise through training, and increasing awareness among breeders about animal wealth and proper nutrition and veterinary health.

In Al-Hasakeh governorate, the key step to improving milk and dairy production is supporting the livestock breeders by providing necessary feed, veterinary services, and supporting forage crops. Encouraging the milk and dairy industry through facilitating marketing and supporting preservation methods is also important.

In Aleppo governorate, current support is limited to providing a certain amount of feed every six months, but with sufficient financial support, additional measures can be taken. These include granting loans to livestock breeders, securing quality feed, establishing a feed production facility, and awaiting approval and support for a milk and cheese factory.

In Al-Raqqa governorate, there are currently no milk or dairy production farms or facilities. Thus, the focus is on establishing dairy cattle stations, cultivating green fodder, and establishing a centralized veterinary pharmacy for the sale of subsidized medicines. There is also a need for renovation and equipment in a sales hall under the Agriculture Committee, which can be supported by incentivizing flagships and livestock breeders to sell their products at subsidized prices.



## 5. Discussion and Recommendations

### 5.1. Summary of Challenges in the Dairy Value Chain

The dairy value chain in Northeast Syria (NES) encounters various challenges that hinder its efficiency and growth. These challenges span across different stages of the value chain, including milk production, collection, processing, and retailing.

**Milk Production:** The main challenges faced by milk producers are the factors affecting the health and nutrition of their livestock, such as limited availability and unaffordability of animal feed and fodder, and limited access to veterinary services and medications. This is directly followed by factors affecting their sales and market access, such as inadequate and insufficient storage and refrigeration options, increased production cost coupled with low market selling prices.

**Milk Collection:** Milk collectors face a primary challenge in the form of inconsistent sale processes, mainly caused by the low quantities of milk provided by farmers. Additionally, their businesses encounter various obstacles due to transportation difficulties. These challenges include limitations in vehicle sizes, issues with refrigeration options that can lead to a decline in milk quality, and rising fuel prices that increase operational costs. The absence of adequate financing and technical assistance further hinders the implementation of necessary improvements.

**Dairy Processing:** The primary challenge faced by dairy processors lies in procuring essential ingredients, which includes dealing with their inconsistent availability, high costs, and insufficient supply. These factors, coupled with the expenses associated with storage and refrigeration, significantly contribute to the increase in dairy production costs. This increase has become particularly impactful due to the low selling prices in the market, thereby affecting the profitability of the producers.

**Retailing and Wholesale:** Retailers struggle with insufficient quantities of production by processors, leading to supply gaps and difficulty in meeting consumer demand. Furthermore, the limited adequate storage capacity of dairy products also affects the retailer's ability to keep stable availability in their shops. Retailers also face varying levels of market information access and require marketing resources for business improvement. On the other hand, wholesalers emphasize the importance of resources such as electricity, water, fuel, and equipment, as well as access to financial support.

**Consumer Challenges:** Consumers in NES face challenges related to the availability and affordability of dairy products. Some products are only occasionally or rarely available, limiting consumer choices. Affordability is a concern due to high prices, particularly for certain products (such as cottage cheese (white cheese), animal ghee, cream and kashkaval). Difficulties in accessing desired products contribute to consumer dissatisfaction. Despite these challenges, consumers prefer local dairy products due to their perceived quality, natural ingredients, and lower cost compared to imports.

Addressing these challenges requires investments in modern equipment, enhanced feed production, access to finance, improved infrastructure, and stronger support from cooperatives and organizations. By overcoming these obstacles, the dairy value chain in NES can achieve higher milk quality, improved profitability for farmers, and sustainable growth.

## 5.2. Recommendations

Based on the challenges identified in the dairy value chain in Northeast Syria (NES) and the insights provided by local authorities, the following recommendations can be made to improve milk and dairy production:

Support Livestock Breeders:

- Provide financial assistance and subsidies to help breeders cope with the climate and economic shocks.
- Ensure availability of quality feed and fodder at affordable prices and promote the cultivation of forage crops and green fodder.
- Improve access to essential veterinary medicines, vaccines, and services to maintain the health and productivity of livestock.
- Provide milk storage and quality control equipment to enhance the quality of produced milk and expand its storage period.

Enhance Dairy Processing Facilities:

- Invest in modern equipment and infrastructure for dairy processing and sterilization to improve the quality of milk and dairy products.
- Facilitate access to financing and low interest loans for dairy processors to upgrade their machinery and expand their operations.
- Establish small-scale dairy and cheese production workshops to increase local processing capacity and support the market demand for dairy products.
- Establish local quality control facilities to test and certify milk and dairy products.

Strengthen Cooperative Infrastructure and Support:

- Promote the formation of dairy cooperatives to provide farmers and milk collectors with a platform for collaboration, resource sharing, and collective marketing.
- Provide technical assistance and training programs to enhance the skills and knowledge of farmers, milk collectors, and processors in modern dairy production techniques.

- Support the establishment of centralized veterinary pharmacies to ensure the availability of affordable and high-quality medicines for livestock.

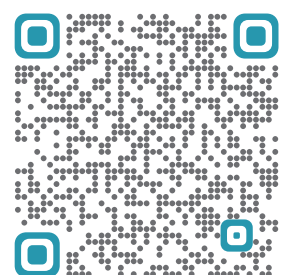
Improve Storage, Transportation, and Marketing:

- Invest in storage facilities and refrigeration options to preserve the quality of milk and dairy products throughout the value chain.
- Improve transportation infrastructure and access to larger vehicles for milk collectors to effectively collect and aggregate milk from small farmers.
- Develop marketing strategies and facilitate market access for dairy processors to reach consumers in other provinces and explore potential export opportunities.

Strengthen Value Chain Resilience:

- Promote the diversification of feed sources and support the establishment of specialized farms for feed production to enhance self-sufficiency in feed supply.
- Encourage the restoration of vegetation covers and natural reserves to provide sustainable grazing areas for livestock.
- Encourage the adoption of sustainable practices in fodder production, such as efficient irrigation methods, organic fertilizers, and integrated pest management. This will improve the productivity and resilience of fodder crops while minimizing environmental impacts.
- Support cultivation of various types of forage crops and grasses. (in-kind seeds).

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