



WHOLE OF SYRIA (WoS)  
**FOOD SECURITY SECTOR**  
*Strengthening Humanitarian Response*

# Animal Feed/Fodder Market Actors Mapping and the Agribusiness of Livestock Feed in Northwest Syria

May 2021



*A poultry farm destroyed by an air strike in Syria. Photo courtesy of NGO Independent Arabia.*

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## I. INTRODUCTION

Quality and availability of livestock feed is critical to ensure sustainable livestock production which can be linked to food security and livelihood restoration in Syria. In Syria, drought tolerant animals like sheep and goats serve as preferred livelihood assets for meat and nutritious milk provision for the people in the semi-arid areas where climate induced aridity is a cause for concern given the climate change impact on ranges and pastures. Poultry also provide meat and nutritious eggs for households. Prior to the onset of the crisis in 2011, livestock accounted for about 40% of Syria's total agricultural production and occupied about 20% of the labor force in rural areas. In addition, 35% of rural households raised livestock, which is considered their main source of food and income<sup>1</sup>. Like the rest of the agricultural sector, and despite the protracted crisis, the various livestock sectors remain a key part of the economy and contribute substantially to the food and nutrition security of the rural population. Livestock production in Syria requires suitable nutrition and supplementary feeding management to maximize its productivity. Cultivated green and conserved fodder, as well as crop residues and processed by-products and residues constitute the main sources of animal feed in Syria. Barley is the major and preferred fodder crop for livestock but, although more drought-tolerant than wheat, its production varies year-on-year depending on weather conditions. The main agricultural stubbles are wheat, barley, and cotton. Cotton seed cake provides the major source of supplementary protein for grazing animals. Wheat bran and straw are the most important crop by-products for feed production. Barley and wheat bran are the most used feed and ingredients for livestock concentrates.

## II. BACKGROUND

Following the 2008/2009 drought and the collapse of government services in 2011, the livestock sector in Syria has suffered substantially, with estimated decreases in flock numbers of 30% for dairy cattle, 40% for sheep and goats and 50% per cent for poultry. Yet up to 50% of rural and peri-urban households in Syria derived substantial food and income from their livestock. Before the onset of the crisis in 2011, the Government of Syria (GoS) supported services to the livestock sector such as extension, fodder rations, cultivation of pasture seeds and seedlings to enhance the productivity of local breeds. With the Syrian crisis animal production is facing degradation of pastures, high costs of processed animal feed and water for livestock, very limited veterinary services, an almost total absence of Transboundary Animal Diseases (TADs) control and increasing circulation of substandard animal production inputs (concentrate feed, vet drugs) in local markets<sup>2</sup>. There is a very real risk of a collapse of Syria's livestock sector with dramatic consequences for rural and peri-urban livelihoods and for food security general. So far, most responses in support of the livestock sector in Syria consist of short-term provision of free mass treatments against endo-and ecto-parasites, sporadic livestock vaccinations, limited distribution of fodder and restocking (sheep, chicken)<sup>3</sup>.

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1 FAO/WFP Crop and Food Security Assessment Mission in Syria, 2019

2 FSL Cluster, North west Syria Livestock Technical Working Group, Terms of Reference, 2020

3 Care Syria, Livestock Emergency Need Assessment North west Syria, April 2018

### III. Study Objectives

Given that animal feed is a limiting factor in livestock production in Syria, humanitarian organizations also assist in fodder production across Syria to increase the supply of animal feed, as well as to improve livestock keeper's access to animal feed at a stabilized price. Hence, there was a flagged need by the Food Security and Livelihood (FSL) Cluster in NWS, and partners to have a better understanding of the geographical coverage of animal feed and fodder processing facilities, animal feed and fodder market actor dynamics across the animal feed/fodder value chain. The study aims to provide recommendations to the implementing partners as per the following specific objectives.

#### Specific objectives

1. Map the geographical coverage of animal feed/fodder factory/sales facilities across NWS.
2. Provide new insights and reduce the information gaps on animal feed manufacturing and animal feed and fodder markets across NWS.
3. Highlight the current practices and challenges of main business actors in the animal feed and fodder value chain in NWS.
4. Highlight and map the capacity and functionality of animal feed and fodder producer factory facilities in NWS.
5. Present the seasonal price fluctuations pattern for animal feed and fodder in NWS.
6. Explore the sales trend in the business of animal feed and fodder e.g., how many customers each business has (customers buying feed/fodder per week or per month, wholesale, or retail...).

Since animal feed varies depending on livestock type and the purpose of rearing livestock (milking or meat), the study covered a wide range of animal feed types. Four different deliverables were produced for this study to ensure comprehensive understanding and to better connect the dots of the different study objectives.

1. **Narrative Report:** The present report provides an overall analysis of the different indicators on the commercial supply chain of the livestock feed at governorate level NWS, in addition to recommendations for future programming that are based on thorough quantitative and qualitative analysis.
2. **Factsheets (Annex A):** A factsheet for each sub-district was developed to summarize the trading and processing activities of animal feed and fodder for the different livestock production. This includes functionality, trading norms, warehousing capacity, number and type of active market actors.
3. **Source of Commercial Animal Feed and Fodder Maps (Annex B):** The maps visualise the regional and local sourcing activities of commercial feed/fodder products.
4. **Interactive Dashboard (Link):** The dashboard summarizes numeric metrics of production/sales volumes, production costs, selling prices, and raw material costs for each type of fodder and animal feed.

## IV. Methodology

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The key informant interviews with animal feed market actors were carried out by enumerators, using a data collection tool with semi-structured questions designed to draw responses based on the study objectives. Study respondents targeted animal feed and fodder facilities (retailers, wholesalers, and factories). The questionnaire was developed by iMMAP in close coordination with the FSL Cluster and the Livestock Technical Working Group for NWS. Selected FSL Cluster partners administered the questionnaire interviews across the geographical target of NWS. Eight organizations participated in the data collection (ATAA, Emisaa, Watan, IHR, IYD, Minber Al-Sham, Risalah, and Shafak). Enumerators met with animal feed and/or fodder facility owners/managers to carry out the mapping of retailers, wholesalers, and factories. The surveys were aimed at exploring the operational capacity of the functional animal feed and/or fodder facilities and the commercialization of the livestock feed and fodder business.

### Data collection

Upon the development of the data collection tool, iMMAP provided online training to familiarize the enumerators on the tool, where the team took into consideration the enumerator's feedback to amend the tool accordingly. The next step was field testing, before kicking off the data collection activity.

### Sampling

The snowball sampling technique was adopted to cover as many facilities as possible across the defined study area. The completed questionnaires were transferred from Syria to the iMMAP office in Amman, Jordan, through the Kobo Collect program. The iMMAP Geographical Information System team developed maps for the report using ArcGIS software. Finally, the narrative report was drafted by iMMAP market and value chain analysts, a food security and livelihood researcher, whereas, the iMMAP production unit worked on the graphic designing component of the report, factsheets, and their layouts.

## V. Results

### A. Traders/Commercial Feed Industry Assessment (Ownership and Type of Business)

A total of 171 animal feed market actors were mapped and interviewed: (1) Animal Feed Manufacturers, (2) Animal Feed Manufacturers and Traders, (3) Animal Feed Traders, and (4) Grinders. The highest number was amongst Animal Feed Traders with 102 traders reached. **Across the targeted areas, all mapped businesses in animal feed supply are privately owned and managed.** The main reported management actor at the local processing and trading of feed facilities was the owner him/her-self. Only one facility in Aleppo governorate and another one in Idleb governorate were reported to be managed by employees.

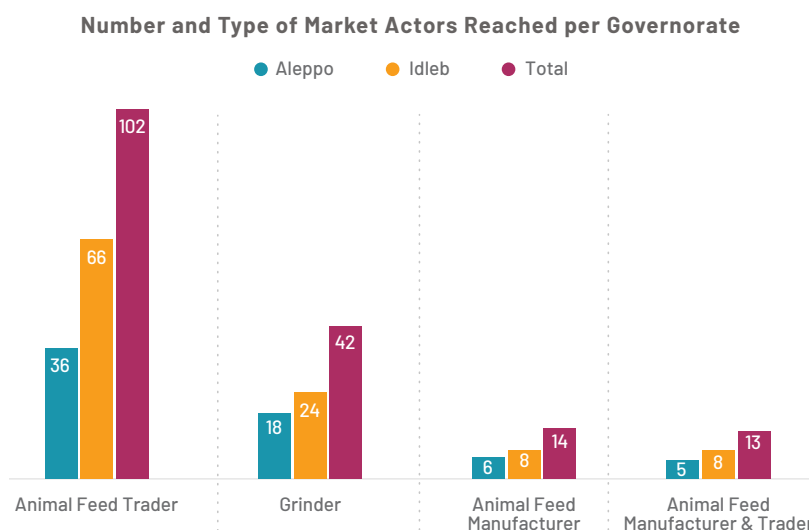


Figure 1: Number and Type of Market Actors Reached per Governorate

#### Animal Feed Manufacturers, and Animal Feed Manufacturers and Traders

Twenty-seven feed manufacturers were assessed of which 14 were only feed manufacturers, and 13 were both manufacturers and traders of animal feed. The numbers are relatively low compared to traders and grinders. **The majority of both manufacturing interviewed actors (44%, n=12) have been active between 1 to 10 years**, followed by 41% (n=11) have been active between 11 to 20 years, the remaining two have been active for more than 20 years.

#### Animal Feed Traders

Traders were strongly present in this assessment, a total of 102 traders were interviewed. The majority of traders were retailers (68%, n=69), and the remaining were wholesalers. In Idleb and Aleppo, the percentages of retailers were 64% (n=42), and 75% (n=27), respectively. **Fifty-six percent (n=57) of traders have been active between 1 to 10 years**, 32% (n=33) have been active between 11 to 20 years and the remaining 7% (n=7) have been active for more than 20 years.

#### Grinders

Forty-two grinders were assessed, the second most active market actors after traders. **Similar to other market actors, most grinders (62%, n=26) have been working between 1 to 10 years**, followed by 31% (n=13) have been active between 11 to 20 years, and the remaining 7% (n=3) have been active for more than 20 years.

## B. Fodder and Animal Feed Producer Factory Status

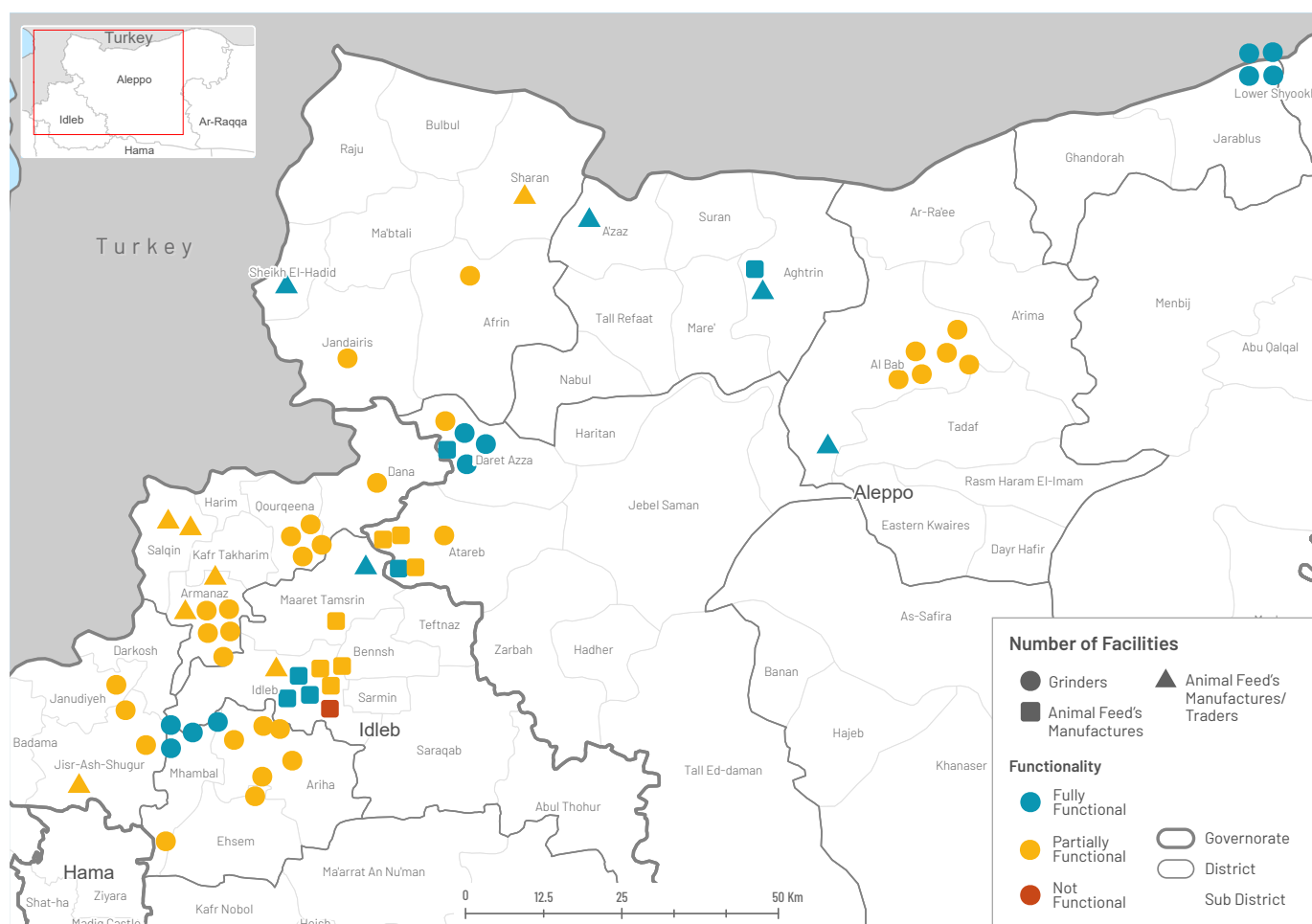
### Animal Feed Manufacturers, and Animal Feed Manufacturers and Traders

Only one of the 27 manufacturers reported to be non-operational at the time of data collection. The non-operational facility is located in Idleb sub-district (Idleb governorate), and the reason of closure was attributed to the increase in prices of inputs. Thirty-seven percent of interviewed manufacturers (n= 10, Idleb= 4, Aleppo= 6) reported to be fully operational, and 59% (n= 16, Idleb = 11, Aleppo= 5) reported partial functionality. The main reported reasons behind partial functionality were the decrease in demand for animal feed products, constant increase in prices of inputs and high competition from imported products.

### Grinders

Twenty-six percent (n=11, Idleb= 4, Aleppo= 7) of the 42 interviewed grinders reported full functionality at the time of data collection, and the remaining 74% (n=31, Idleb= 20, Aleppo= 11) reported partial functionality. For grinders, the reported reasons behind the partial functionality were similar to manufacturers, the decrease in demand for animal feed products, constant increase in prices of inputs, high competition from imported products, in addition to displacement and decrease in livestock count.

**Map 1:** Functionality of Grinders and Animal Feed Manufacturers





## Infrastructure Rehabilitation Needs

Grinders and Animal Feed Manufacturers were asked about the need of rehabilitation for their facilities, the majority (63.2%) reported that their facility's condition is well maintained and there is no need for rehabilitation, this was followed by 16.2% reporting the need for minor rehabilitation. The estimated cost range for each rehabilitation need are summarized in Table 1 below

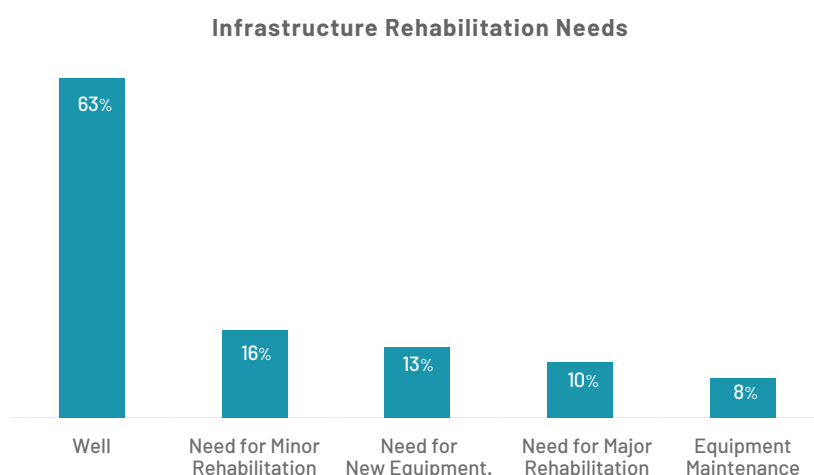


Figure 2: Infrastructure Rehabilitation Needs

	Building Rehabilitation	Equipment Maintenance	New Equipment
Estimated Cost Range	US\$600 - US\$15,000	US\$800-US\$10,000	US\$2,000-US\$100,000

Table 1: Estimated facility rehabilitation cost.

## C. Fodder and Animal Feed Production and Sales

### Fodder Production and Sales

Compared to animal feed, the number of market actors who reported producing or trading fodder is relatively low. The assessment covered the different types of fodder used for various purposes. Only one trader in Idleb reported trading Alfalfa with an average monthly production higher during the winter season compared to the summer. As for corn silage, six traders and one grinder reported producing corn silage. Finally, the number of market actors who reported trading or producing Azula was two traders. As for sales volume, corn silage reported to have the highest average sales volumes, in addition to the highest number of traders involved in trading it.

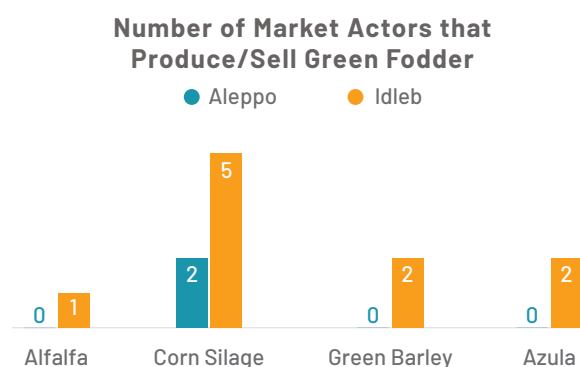


Figure 3: Number of Market Actors that Produce/Sell Green Fodder

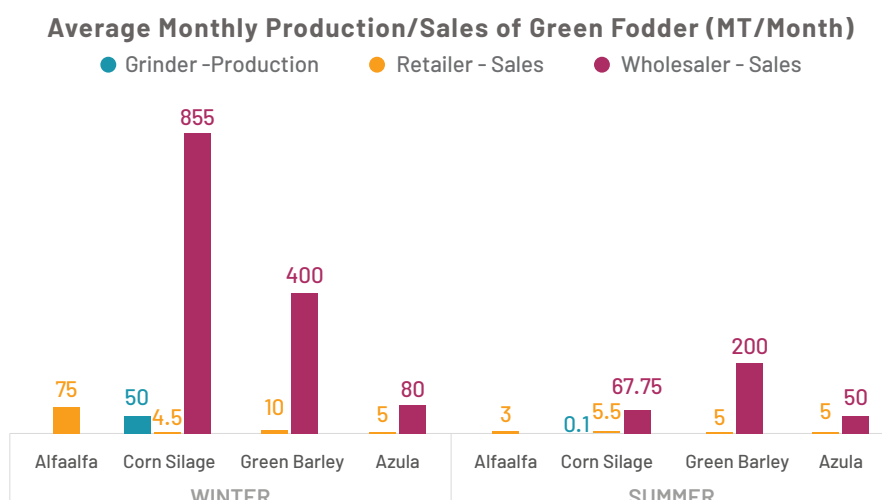


Figure 4: Average Monthly Production/Sales of Fodder (MT/Month)

## Animal Feed Production and Sales

The use of animal feed varies depending on the livestock type, and the purpose of livestock rearing. For this assessment animal feed products were covered for the following purposes of livestock rearing:

1. Cow-milking
2. Cow-meat
3. Sheep-milking
4. Sheep-meat
5. Poultry-eggs
6. Poultry-meat

The number of market actors involved in the production and trading of animal feed is significantly higher compared to green fodder products. Animal feed for poultry production was the least common amongst the interviewed market actors. In terms of production and sales volume, this varied significantly across the different actors and different locations. Winter seasons reported to have slightly higher production and sales volumes. Figure 6 - summarize the reported average monthly production/sales for each animal feed product. The highest average monthly production was reported by Animal Feed Manufacturers for cow-milking purposes with an average of 217 MT/month, followed by cow-meat purposes by the same actor with an average of 138 MT/month. As for sales volumes, the highest average was reported by wholesalers for cow-milking and co-meat purposes with an average monthly sales volume of 104 MT/month and 105 MT/month respectively.

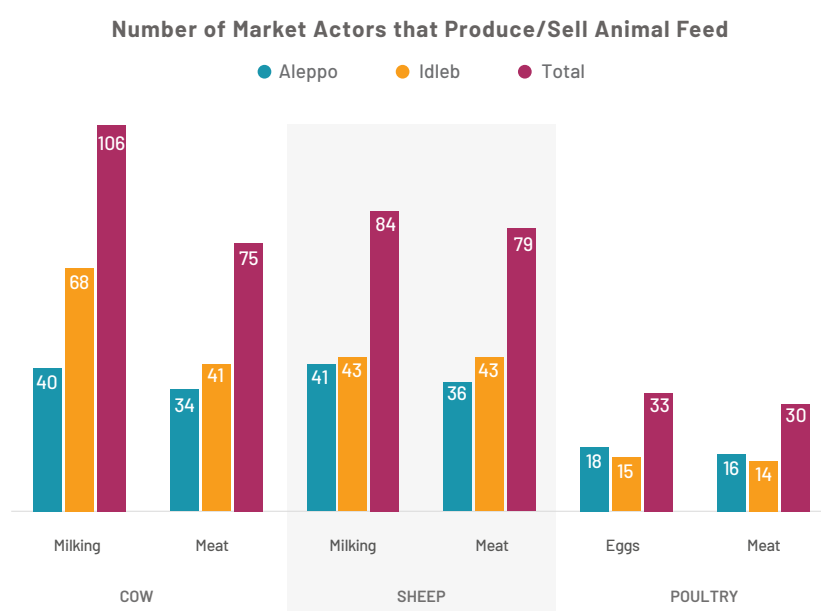


Figure 5: Number of Market Actors that Produce/Sell Animal Feed

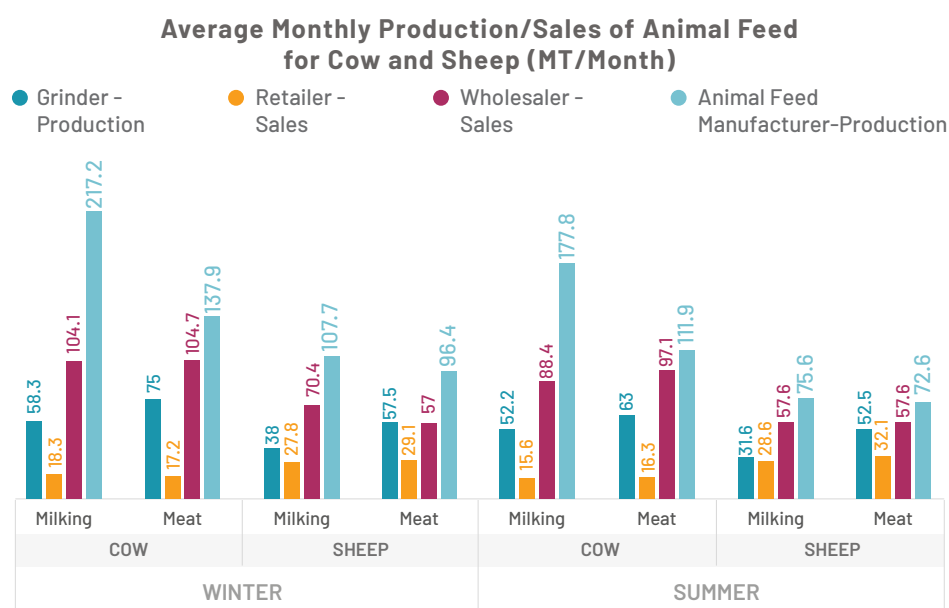


Figure 6: Average Monthly Production/Sales of Animal Feed for Cow and Sheep (MT/Month)

The monthly sales volume of poultry feed was significantly higher compared to cow and sheep feed production and sales, despite the number of market actors involved in poultry feed is low. Moreover, poultry sales during summer are reportedly higher compared to other types of animal feed where the sales and production is higher during winter time. The highest sales of poultry feed were reported in Idleb sub-district for meat purposes with an average monthly sales volume of 300 MT/month.

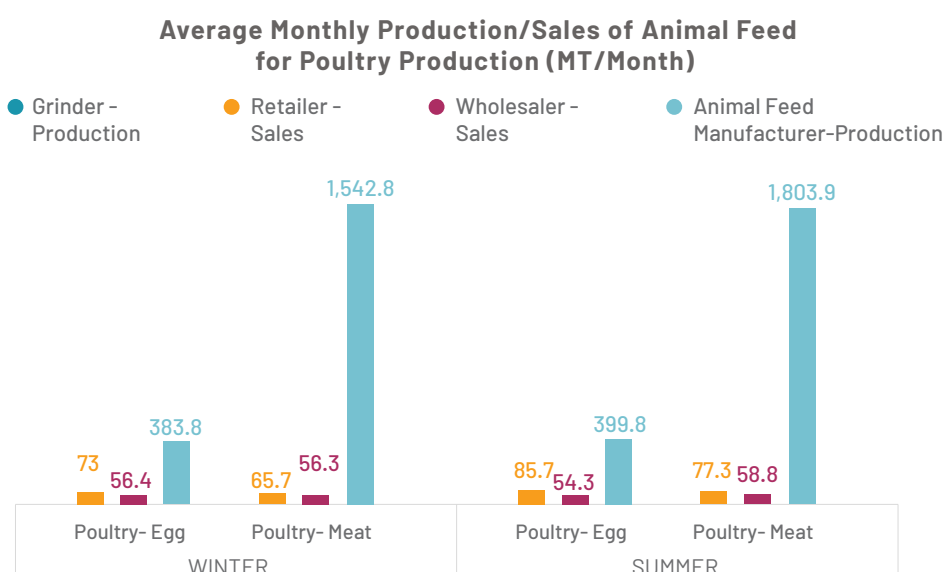


Figure 7: Average Monthly Production/Sales of Animal Feed for Poultry Production (MT/Month)

## Animal Feed Mixtures Production and Sales

Animal feed mixtures are only produced by grinders, the process just entails grinding a mixture of raw material. The mixture varies depending on the livestock type and purpose of rearing livestock. Only one grinder in Aleppo governorate, reported producing feed mixture for poultry-egg production, and none of the grinders reported producing feed mixtures for poultry-meat production.

Grinders were asked about the average monthly production of each feed mixture type and how this changes seasonally. Cow-milking feed mixture producers reported the highest average monthly production volume with 36.2 MT/month during the winter season. In terms of seasonality trends, similar to animal feed products, feed mixtures tend to have higher production volumes during the winter season.

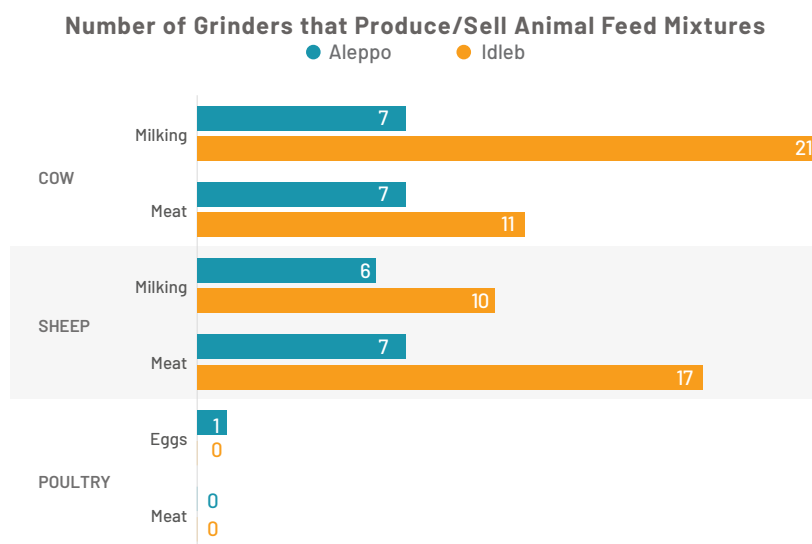


Figure 8: Number of Grinders that Produce/Sell Animal Feed Mixtures

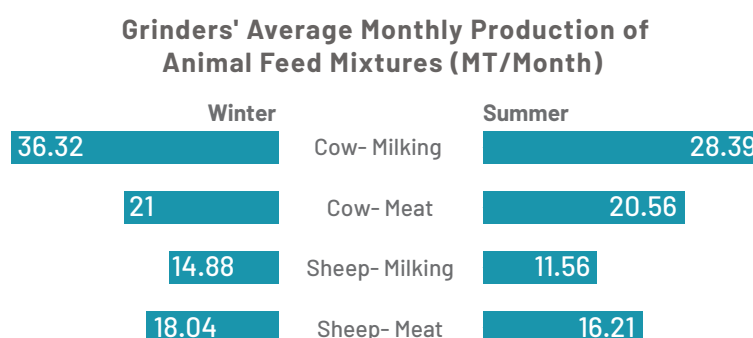


Figure 9: Grinders' Average Monthly Production of Animal Feed Mixtures (MT/Month)

## D. Production Cost per Metric Ton

### Animal Fodder Production Cost

As mentioned in the previous section the number of market actors who produce fodder is relatively low therefore, the reported production costs of each type of fodder were retrieved from a low number of respondents. Table 2 summarizes the average production cost of the different types of fodder. The seasonality trends for Alfalfa and Azula show that production cost during summer is higher compared to winter season, whereas for Corn Silage and Green Barley numbers show opposite trends.

	Alfalfa	Corn Silage	Green Barley	Azula
Average Production Cost (USD/MT)	Winter: 220 Summer: 250	Winter: 103.14 Summer: 62.44	Winter: 146 Summer: 116	Winter: 240 Summer: 290
Number of Respondents	1	7	2	2

Table 2: Fodder Average Production Cost



## Animal Feed Production Cost

The average animal feed production costs of the different types were reported to be within relatively the same average range. Production cost for poultry feed was reported to be higher compared to other livestock types. The interesting seasonality trend shows that the production cost of animal feed during wintertime is higher compared to summer season. This can be linked to the fact that prices of most raw materials like wheat, barley and barn are lower during summertime, that is post-harvest of produce. Animal feed for poultry-egg production reported the higher average production cost with 341.06 USD/MT during winter season, and the average production cost of animal feed for sheep-meat production reported the lowest with 244.22 USD/MT during summer season.

**Average Production Cost in USD per 1 MT of Animal Feed**

Winter		Summer
311.16	Cow- Milking	284.25
276.17	Cow- Meat	256.71
291	Sheep- Milking	268.01
272.57	Sheep- Meat	244.22
341.06	Poultry-Egg	316.97
394.33	Poultry-Meat	370.07

*Figure 10: Average Production Cost in USD per 1 MT of Animal Feed*

## Production Cost of Animal Feed Mixtures

As mentioned earlier mixtures are usually produced by grinders, and the mixture varies depending on the type of livestock and the purpose of rearing the livestock. The reported average production cost which includes raw materials closely ranged between the different types of feed mixtures. Summer season production cost is slightly less compared to the winter season.

**Average Production Cost in USD per 1 MT of Animal Feed Mixtures**

Winter		Summer
284.29	Cow- Milking	256.71
262.22	Cow- Meat	219.72
271.88	Sheep- Milking	231.56
260.42	Sheep- Meat	226.96

*Figure 11: Average Production Cost in USD per 1 MT of Animal Feed Mixtures*

## E. Production Change

### Production Change of Animal feed and Fodder, 2021 vs 2020

The percentage of market actors who reported a decrease in their production/sales of Animal feed and Fodder was higher in Aleppo governorate. The reported reasons were linked to displacement of people which led to a decrease in the livestock count, increased prices of inputs, high competition from imported products, and input-output prices and currency fluctuations. The reported reasons for market actors in Idleb governorate who reported decrease in production were similar to Aleppo governorate. Overall, there is a relatively high number of market actors who reported stable production over the last year.

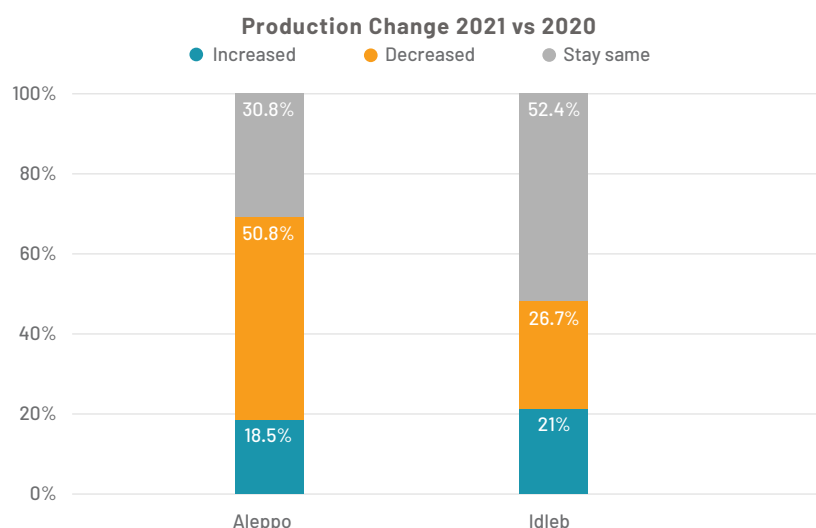


Figure 12: Production Change 2021 vs 2020

### Production Change of Animal Feed and Fodder, 2021 vs 2011

Only 72 market actors were open in 2011, and the remaining interviewed actors opened after 2011. For those who operated in 2011, the majority reported a decrease in their production/sales of Animal feed and Fodder, compared to the current time. The reported reasons in both governorates were linked to displacement of people which led to a decrease in the livestock count, increased prices, unstable security situation, shortage in input supply, high competition from imported products, and input-output prices and currency fluctuations.

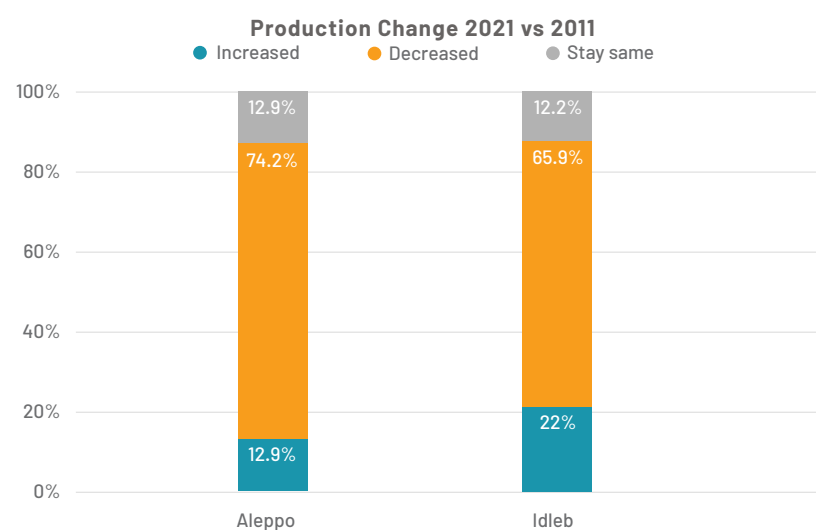


Figure 13: Production Change 2021 vs 2011

## F. Needed Support to Sustain or Improve Business Operations.

The most reported challenges by the different market actors were related to lack of working capital including the shortage of business grant assistance, inputs support (including fuel and raw materials), machine support, and need to advocate for resuming exporting activities, and medicines and vaccines assistance. The most reported challenge classified by study respondents type were as follow; need for machine support for Grinders' owners (34%, n=14), lack of business grant assistance for traders both wholesalers (29%, n=12) and retailers (32%, n=22), and need for machine support for manufacturing facilities (33%, n=4).

## G. Availability and Source of Commercial Products

### For animal feed manufacturing

The data recorded that both types of commercial animal feed (beleet and mixtures) were widely available across the assessed sub-districts (15 sub-districts in Aleppo governorate and 15 sub-districts in Idleb governorate) in both summer and winter seasons. It is worth mentioning that only 1 out of the 170 study respondents reported that animal feed was rarely available in Bulbul sub-district, and another one responded reported that animal feed was not available in Sharan sub-district. However, other participants from the same sub-districts responded that animal feed products were available. This might indicate inconsistent access to market information, challenges in transporting the livestock feeds to their areas, and/or lack of physical access to market for those respondents. Furthermore, all the study respondents (n=170) reported that the different types of animal feed mixtures were available in both winter and summer seasons.

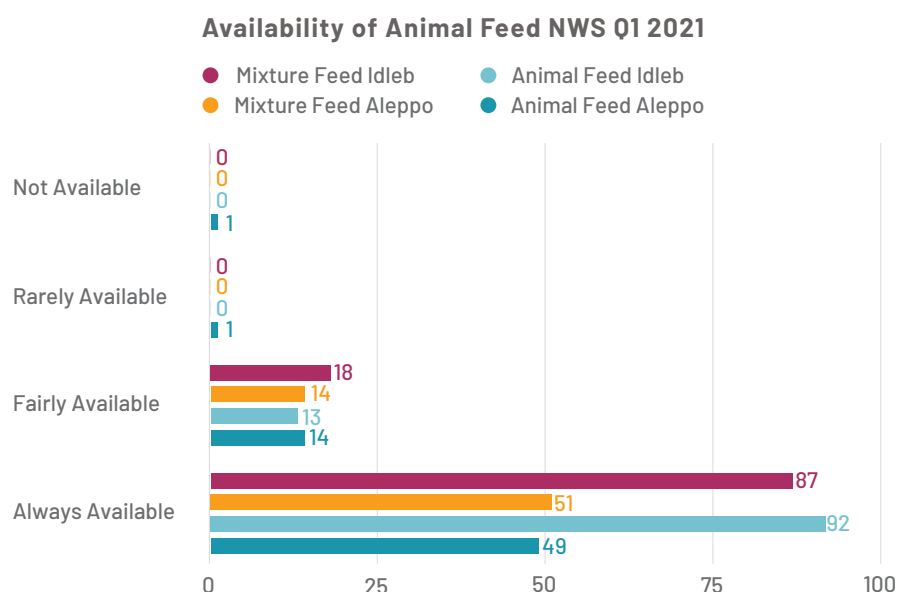


Figure 14: Availability of Animal Feed NWS Q1 2021

## For fodder/feed trade

The availability of green fodder including (wheat, barley, barn, hay, corn, soya, cotton, lentil, and animal vitamins), was **reported to be limited in both winter and summer seasons across the assessed sub-districts where the majority (78%, n=133) reported that the availability of green fodder ranged between rarely available (23%, n=39) and not available (55%, n=94).** Different reasons were reported by respondents that contributed to the lack of availability of fodder such as low number of producers of green fodder plants coupled, high cost of production, storage limitation, needs of large land space and high amount of water.

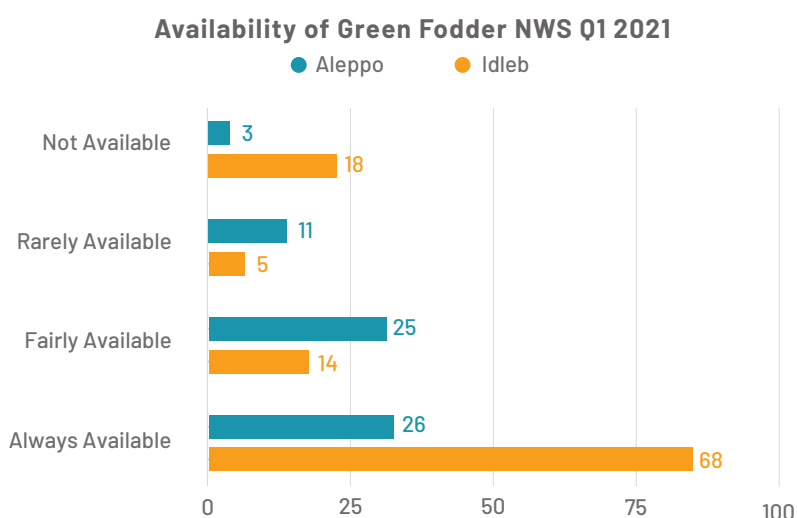


Figure 15: Availability of Green Fodder NWS Q1 2021

## For raw materials

This study focused on the availability of the main raw materials for animal feed, barley, barn, corn, animal vitamins, soya, cotton, wheat, lentil, and hay. Collected data showed that raw materials were widely available in North West Syria (NWS). Most study respondents (59%) reported that raw materials were always available and 38% reported that raw materials were fairly available. The following are some challenges reported by different study respondents:

1. Raw materials are not locally produced.
2. Raw materials are being imported from Northeast Syria or from Turkey.
3. Limited availability of local feed mills and/or processing factories.

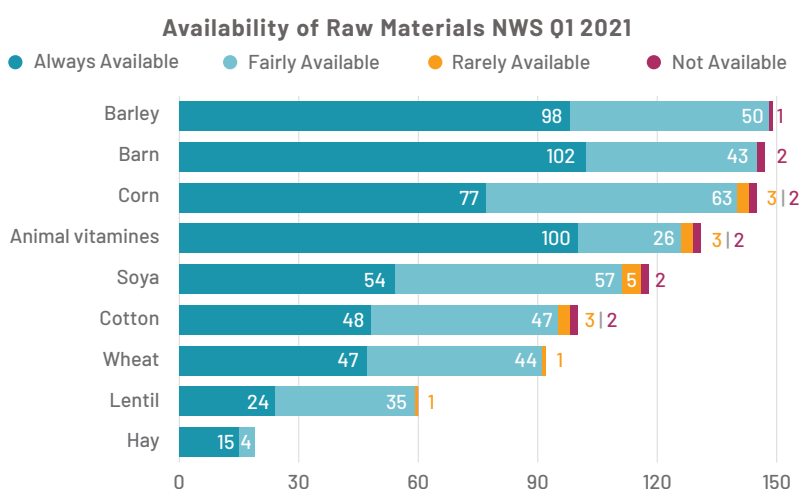


Figure 16: Availability of Raw Materials NWS Q1 2021



## Sources of Commercial Animal Feed

Most interviewed traders (58%) reported sourcing commercial animal feed from local producers, followed by 27% importing from Turkey. The reported sources mostly remain the same across the two seasons (winter and summer). However, 9% of traders (n=4 Idleb, n=6 Aleppo) reported changing from importing to Turkey to either sourcing locally or from the northeast Syria region during the summer season.

### Reported Sources of Commercial Animal Feed

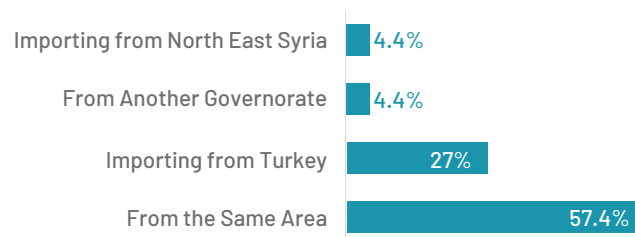


Figure 17: Reported Sources of Commercial Animal Feed

## For fodder/feed trade

Unlike animal feed, **traders mostly import fodder from Turkey or northeast Syria region**. Most traders (42%) reported importing from nearby Turkey, followed by 28% reported sourcing from local producers. Sources of commercial fodder remain the same across the two seasons (winter and summer).

### Reported Sources of Commercial Fodder

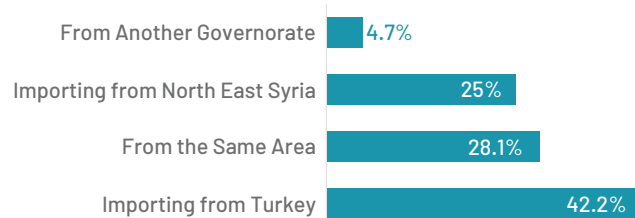


Figure 18: Reported Sources of Commercial Fodder

## Sources of Raw Material

**Majority of market actors who use wheat, barley, barn, corn and lentils in their production reported sourcing these raw materials from local producers and traders.** Market actors who use hay mostly reported sourcing hay from the northeast Syria region. The three commodities that were reported to be mostly imported from Turkey are soya, cotton and animal vitamins.

## H. Seasonal Prices of Raw Materials for Animal Feed

The lowest reported average price of 1 MT of animal feed for cow-milking purpose during winter and summer seasons across the different interviewed market actors was at grinders' gate with 294 USD/MT during winter season, and 263 USD/MT during summer season, followed by retailers' gate with 318 USD/MT during winter season, and 293 USD/MT during summer season, then wholesalers' gate with 322 USD/MT during winter season, and 299 USD/MT during summer season, and finally animal feed manufacturers recorded highest average price with 335 USD/MT during winter season, and 310 USD/MT during summer season.

The overall average selling price of 1 MT of animal feed for cow-milking purposes during winter seasons was 317 USD, and it ranged between 170 USD and 425 USD. Idleb sub-district recorded the lowest reported price (170 USD/MT), and the highest reported price (425 USD/MT) as well. The overall average price during summer season reported to be lower by 8% (291 USD/MT). In summer it ranged between 170 USD and 425 USD, where the lowest price during summer season was reported in Jarablus and Jandairis sub-districts (170 USD /MT), whereas Idleb sub-district recorded the highest price (425 USD/MT).

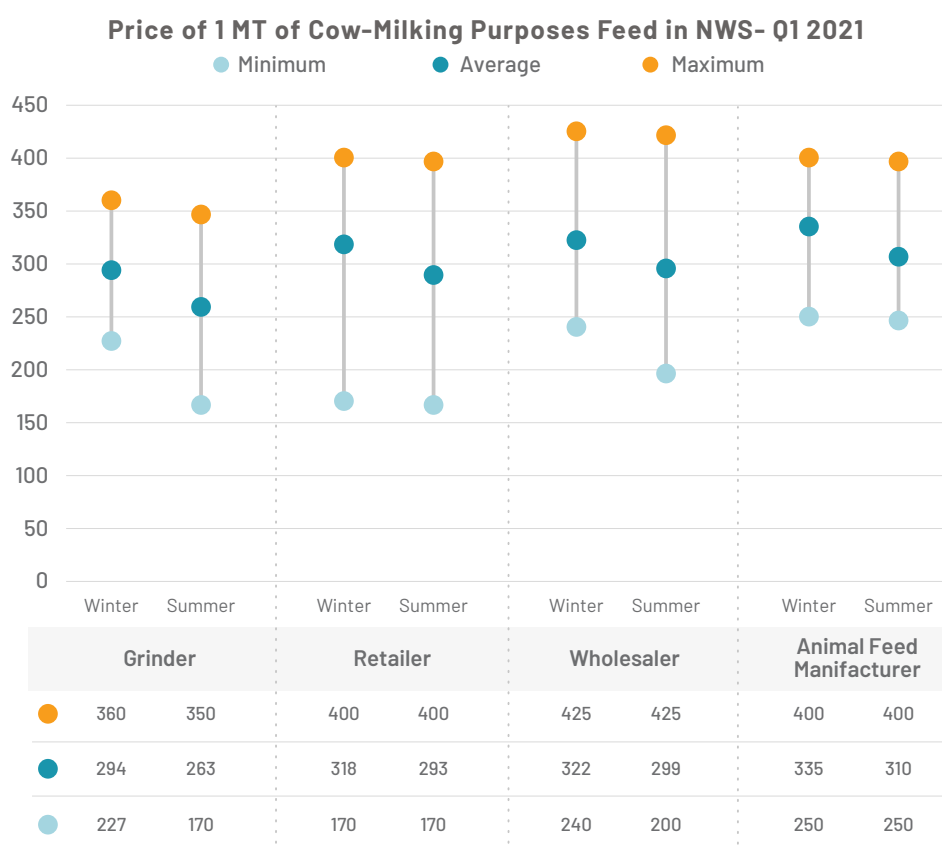
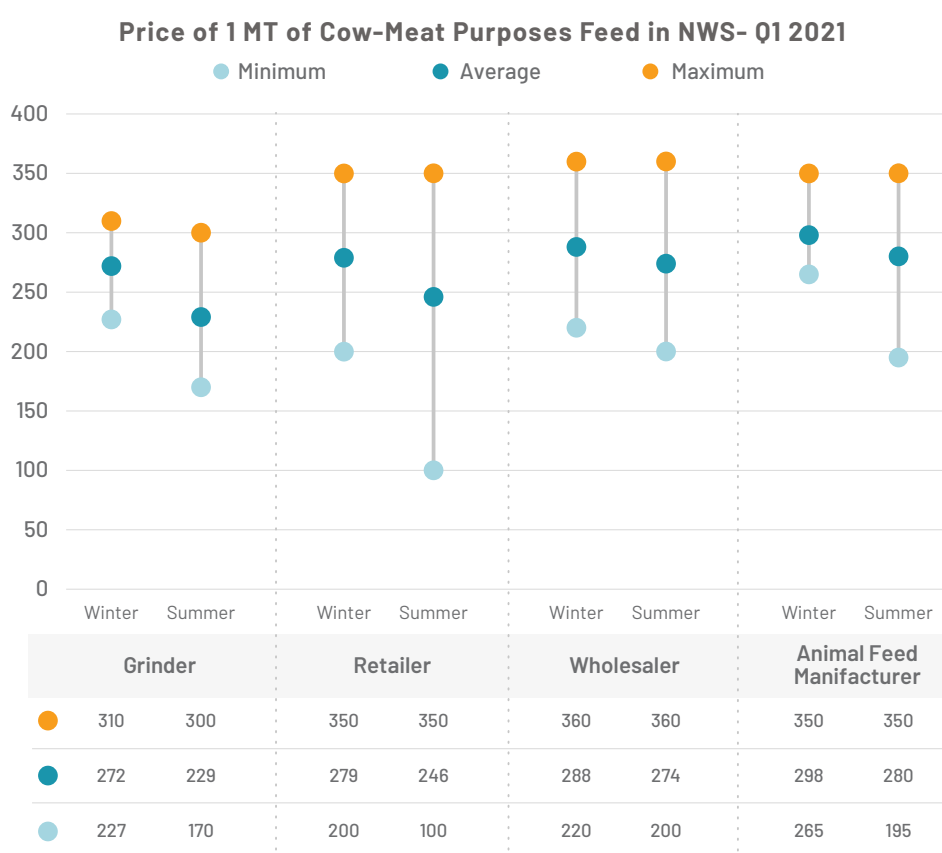


Figure 19: Price of 1 MT of Cow-Milking Purposes Feed in NWS- Q1 2021

## Cow-meat purpose

The lowest reported average price of 1 MT of animal feed for the cow-meat purpose during winter and summer seasons across the different interviewed market actors was at grinders' gate with 272 USD/MT during winter season, and 229 USD/MT during summer season, followed by retailers' gate with 279 USD/MT during winter season, and 246 USD/MT during summer season, then wholesalers' gate with 288 USD/MT during winter season, and 274 USD/MT during summer season, and finally animal feed manufacturers recorded highest average price with 298 USD/MT during winter season, and 280 USD/MT during summer season.

The overall average selling price of 1 MT of animal feed for cow-meat purposes during winter seasons was 284 USD and it ranged between 200 USD and 360 USD. Idleb sub-district hosted the lowest reported price (200 USD/MT), and the highest reported price (360 USD/MT) as well. The overall average price during summer season reported to be lower by 10% (257 USD/MT), it ranged between 100 USD and 360 USD, Idleb sub-district hosted the lowest reported price (100 USD/MT), and the highest reported price (360 USD/MT) as well.

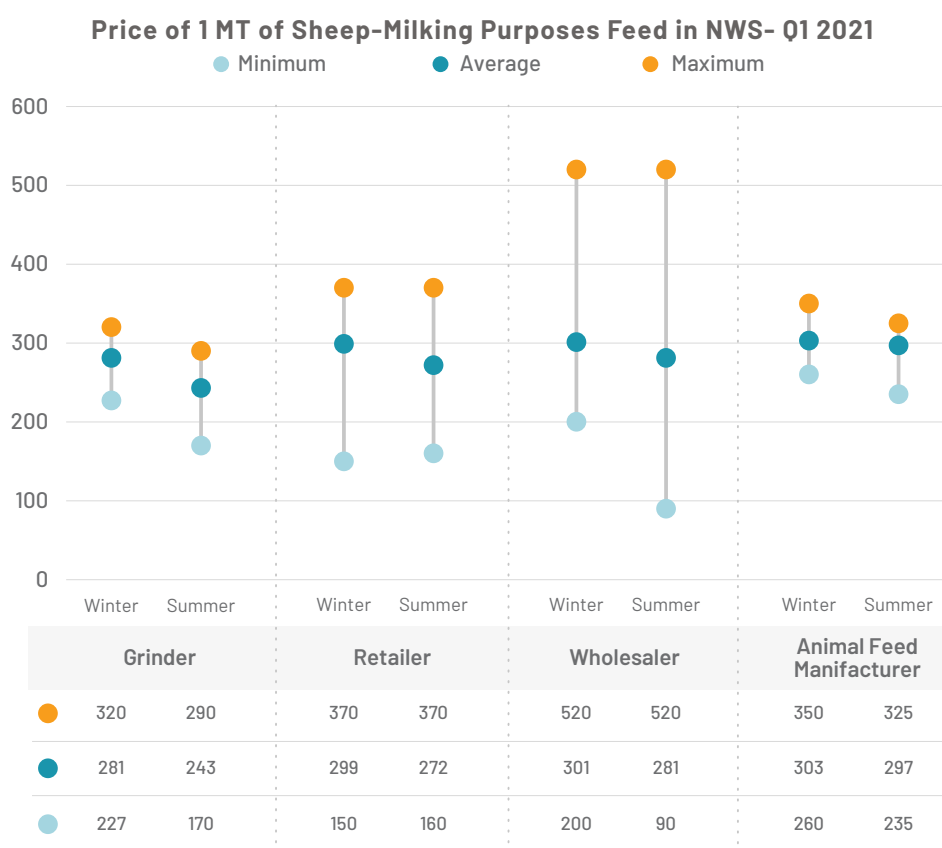


**Figure 20:** Price of 1 MT of Cow-Meat Purposes Feed in NWS- Q1 2021

## Sheep – Milk purpose

The lowest reported average price of 1 MT of animal feed for Sheep-Milking purposes during winter and summer seasons across the study respondents' type was at grinders' gate with 281 USD/ MT during winter season, and 243 USD/MT during summer season, followed by retailers' gate with 299 USD/MT during winter season, and 272 USD/MT during summer season, then wholesalers' gate with 301 USD/MT during winter season, and 281 USD/MT during summer season, and finally animal feed manufacturers recorded highest average price with 303 USD/ MT during winter season, and 297 USD/MT during summer season.

The overall average selling price of 1 MT of animal feed Sheep-Milking purposes during winter seasons was 296 USD and it ranged between 150 USD and 520 USD. Idleb sub-district recorded the lowest price (150 USD / MT), whereas Sharan sub-district recorded the highest price (520 USD/MT). The average price during summer season reported to be lower by 8 % (273 USD/MT), it ranged between 90 USD and 520, like the winter season, lowest reported price in summer season reported in Idleb sub-district (90 USD /MT), whereas Sharan sub-district recorded the highest price (520 USD/MT).



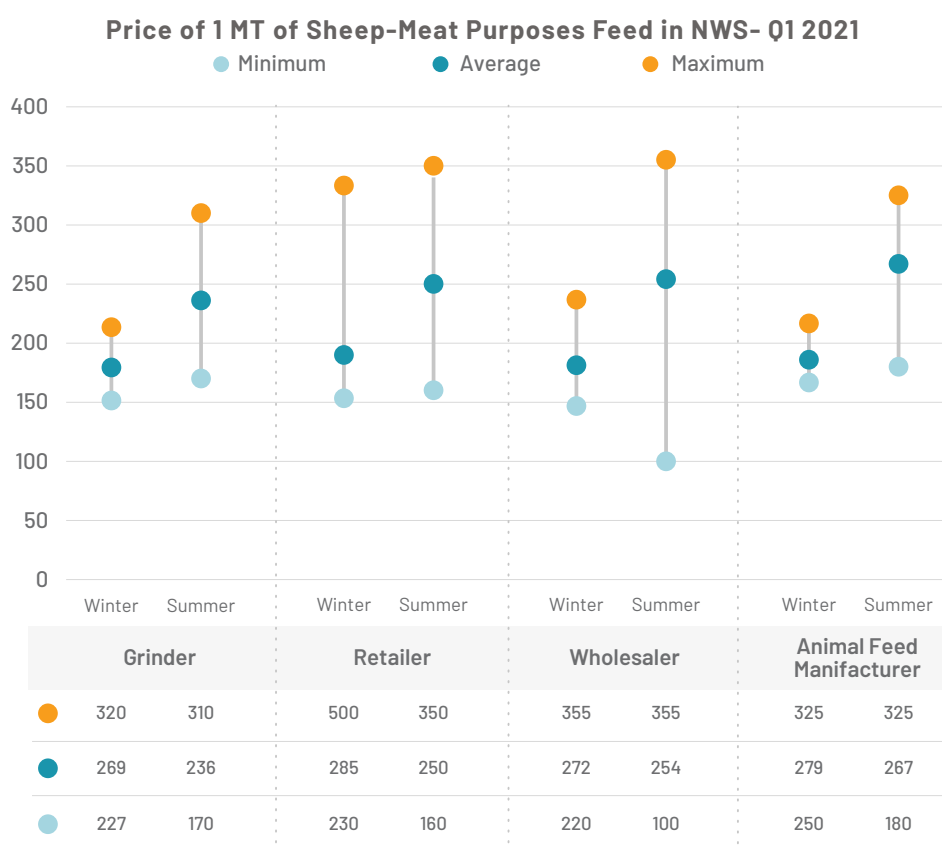
**Figure 21:** Price of 1 MT of Sheep-Milking Purposes Feed in NWS- Q1 2021



## Sheep Meat Purpose

The lowest reported average price of 1 MT of animal feed for Sheep-Meat purpose during winter and summer seasons across the respondents' type was at grinders' gate with 269 USD/ MT during winter season, and 236 USD/MT during summer season, followed by wholesalers' gate in winter season with 272 USD/MT during winter season, and retailers' gate in summer season with 250 USD/MT, then animal feed manufacturers' gate came third in winter season with 279 USD/MT, whereas wholesalers' gate came third in summer season with 254 USD/MT. Average price was the highest at retailers' gate during winter season with 285 USD/MT, and it was the highest at animal feed manufacturers' gate during summer season with 267 USD/MT.

The average selling price of 1 MT of animal feed for Sheep-Meat purposes during the winter season was 276 USD and it ranged between 220 USD and 500 USD. Sharan sub-district recorded the lowest price (220 USD/MT), whereas Idleb sub-district recorded the highest price (500 USD/MT). The average price during summer season reported to be lower by 9 % (252 USD/MT), it ranged between 100 USD and USD 355. Idleb sub-district recorded the lowest reported price (100 USD /MT), and the highest reported price (355 USD/MT) as well.

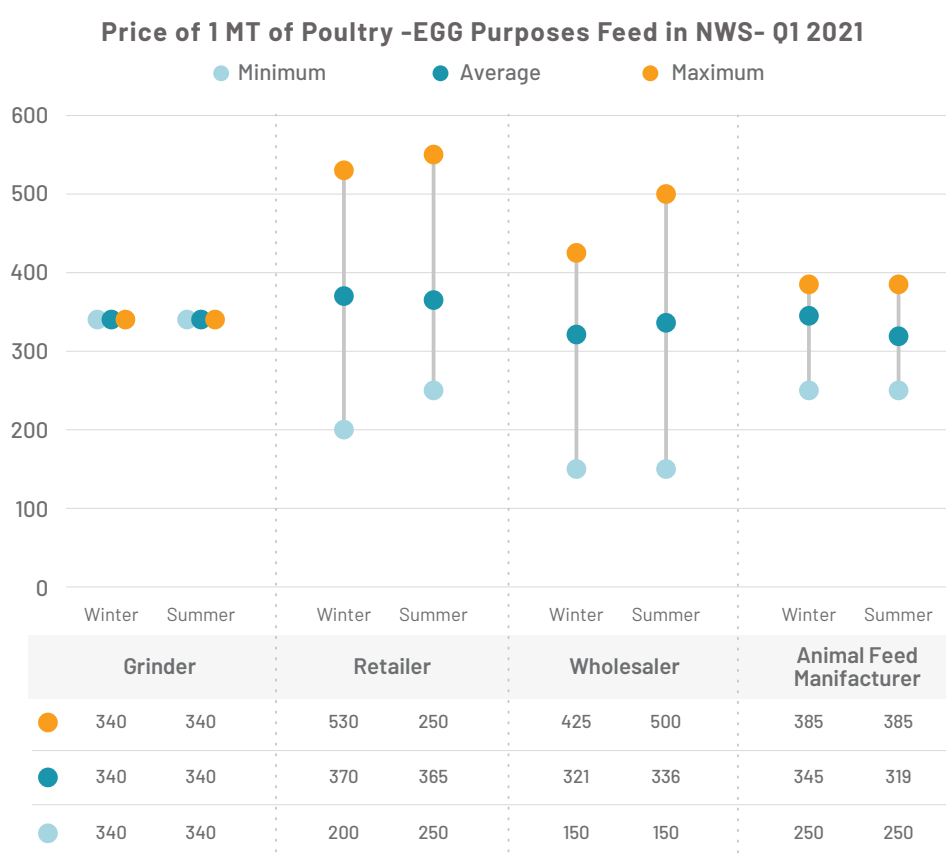


**Figure 22:** Price of 1 MT of Sheep-Meat Purposes Feed in NWS- Q1 2021

## Poultry Egg

The lowest reported average price of 1 MT of animal feed for Poultry Egg purpose during winter season was at wholesalers' gate with 321 USD/ MT, and during summer season was at animal feed manufacturers' gate with 319 USD/MT, followed by grinders' gate during winter season with 340 USD/MT, and wholesalers' gate during summer season with 336 USD/MT, the average price came third at animal feed manufacturers' gate in winter season with 345 USD/MT, and at grinders' gate in summer season with 340 USD/MT. Average price was the highest at retailers' gate during winter and summer seasons with 370 USD/MT, and 365 USD/MT, respectively.

The average selling price of 1 MT of animal feed for Poultry Egg purpose during winter seasons was 344 USD and it ranged between 150 USD and 530 USD. Idleb sub-district recorded the lowest price (150 USD/ MT), whereas Daret Azza sub-district recorded the highest price (530 USD/1 MT). The average price during summer season reported to be lower by only 1 % (340 USD/MT), it ranged between 150 USD and 550. Sharan sub-district hosted the lowest reported price (150 USD /MT), whereas the highest reported price (550 USD/MT) was in Daret Azza sub-district.



**Figure 23:** Price of 1 MT of Poultry -EGG Purposes Feed in NWS- Q1 2021

## Poultry Meat

The lowest reported average price of 1 MT of animal feed for Poultry Meat purpose during winter season was at wholesalers' gate with 387 USD/MT/winter season, and during summer season was at retailers' gate with 366 USD/1 MT/summer season, followed by retailers' gate in winter season with 389 USD/MT, and wholesalers' gate in summer season with 387 USD/MT. Average price was the highest at animal feed manufacturers' gate during winter and summer seasons with 470 USD/MT, and 433 USD/MT, respectively.

The average selling price of 1 MT of animal feed for Poultry Meat purpose during winter seasons was 415 USD and it ranged between 180 USD and 530 USD. Sharan sub-district recorded the lowest price (180 USD /MT), whereas Daret Azza sub-district recorded the highest price (530 USD/MT). The average price during summer season reported to be lower by 5 % (395 USD/MT), it ranged between 150 USD and 525. Sharan sub-district recorded the lowest reported price (150 USD /MT), whereas the highest reported price (525 USD/MT) was in Maaret Tamsrin sub-district.

## Price of Fodder feed

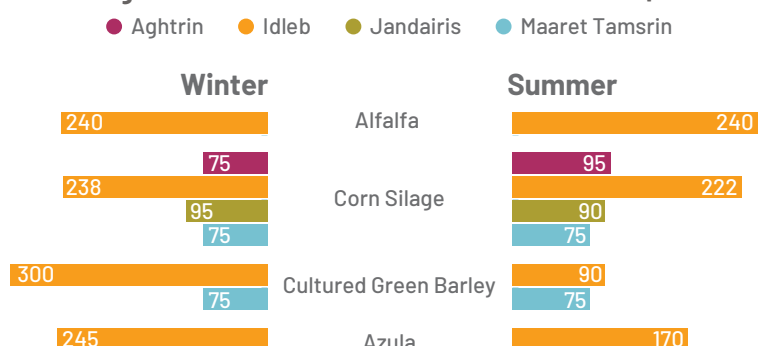
As mentioned above the availability of fodder is very limited, across the 30 assessed sub-districts, prices of fodder were reported only at four sub-districts, (Aghtrin and Jandairis in Aleppo governorate and Idleb and Maaret Tamsrin in Idleb governorate). Also, regarding the type of fodder, corn silage was the only type that has been reported across the four sub-districts. In addition, all types of fodder were reported at Idleb sub-districts.



Figure 24: Price of 1 MT of Poultry-Meat Purposes Feed in NWS- Q1 2021

Azula fodder recorded the highest price with 254 USD/MT during winter season, followed by Aflalfa with 240 USD/MT during winter season, then the cultured Green barley with 188 USD/MT during winter season, and Corn silage recorded last with 160 USD/MT during winter season. The prices in the summer season were lower as compared to winter. The green barley cultured recorded the highest increase rate with 56% (83 USD/MT in summer season, and 188 USD/MT in winter season), followed by Azula fodder with 31% increase rate (170 USD/MT in summer season and 245 USD/MT in winter season), then corn silage with 4% increase rate (155 USD/MT in summer season, and 160 USD/MT in winter season), however the Alfalfa did not record any difference in the price between the winter and summer season.

**Average Price of 1 MT of Green Fodder in NWS- Q1 2021**



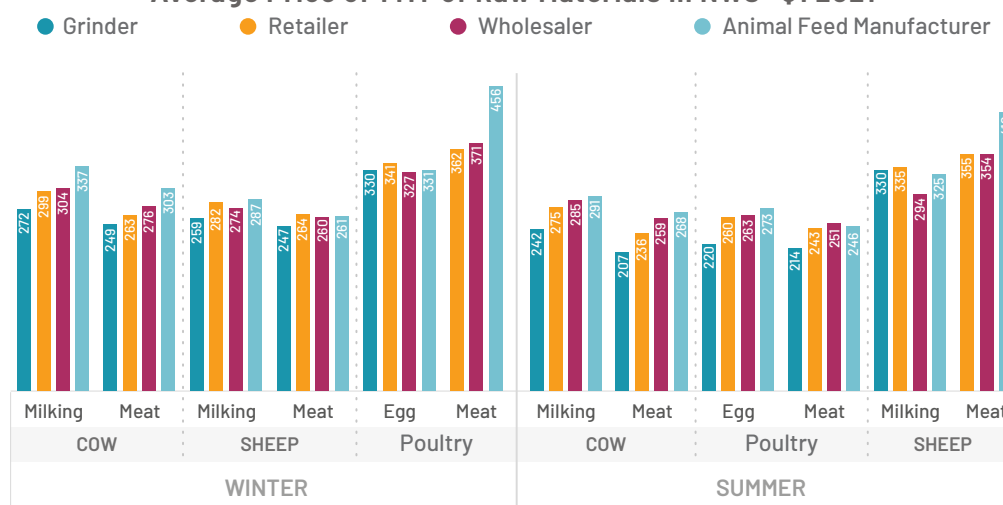
**Figure 25:** Average Price of 1 MT of Fodder in NWS- Q1 2021

### Cost of raw materials for manufacturing

In terms of cost of raw materials, this study looked at the main types of raw materials that were being used for producing animal feed (both Pellets and Mixture types). Soya material recorded the highest price across with 560 USD/MT as an average price during winter season, followed by Cotton material, with 350 USD/MT as an average price during winter season, and lentil material came third with 346 USD/MT as an average price during winter season. The lowest reported price of raw materials was hay with 197 USD/MT as an average price during the winter season.

The raw material cost during winter season was reported to be higher as compared to summer season, the price of wheat recorded the highest increase rate with 24% (240 USD/MT in summer season, and 314 USD in winter season), followed by barley with 14% increase rate (221 USD/MT in summer season, and 256 USD/MT in winter season), and barn came third with 12% increase rate (215 USD/MT in summer season, and 245 USD/MT in winter season).

**Average Price of 1 MT of Raw Materials in NWS- Q1 2021**



**Figure 26:** Average Price of 1 MT of Raw Materials in NWS- Q1 2021



## I. Quality Control across the fodder/animal feed value chain

The majority of interviewed market actors (96%) reported that laboratory facilities are not available in their area, with only six actors reported having access to such facilities in Atareb sub-district (Aleppo governorate), and in Armanza, Idleb, Maaret Tamsrin, and Qourqeen subdistricts, Idleb governorate. The laboratories offer tests to measure protein, energy and humidity levels in animal feed and fodder material. It is worth mentioning here that within the same sub-districts where actors reported availability, other actors reported that laboratory services are not available. This can give an indication that not all actors have the same level of knowledge when it comes to lab tests and access to laboratory services. On the other hand, seven Animal Feed Manufacturers reported that they conduct such laboratory inspections in Turkey, where the costs of the different tests can range between USD25 to USD200.

Availability of Laboratories in the Area

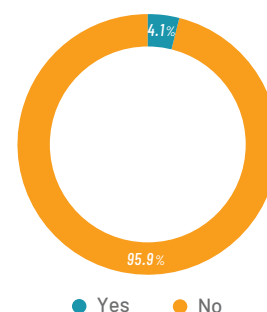


Figure 27: Availability of Laboratories in the Area

## J. Taxes

Interviewed actors were asked whether they pay taxes for their local authorities, interestingly none of the interviewed market actors in Idleb governorate reported paying taxes. On the other hand, 37% (n=24) of interviewed market actors in Aleppo governorate reported that they pay taxes to local councils, or the chamber of industry. Majority of those who pay taxes pay on a yearly basis (21 out of 24), and three reported paying on a monthly basis. The tax payment amount for those who pay on a yearly basis ranged between USD50-USD500 per year, and the monthly payments ranged USD10-USD15.

Percentage of Market Actors who Pay Taxes

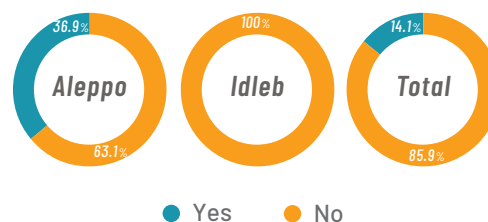


Figure 28: Percentage of Market Actors who Pay Taxes

## Selling Modality, Supply, and Demand

Data recorded that both cash and selling on credit modalities were commonly used at the assessed sub-districts. The percentage of respondents who reported using only cash modality was higher in Idleb governorate (15%, n=16) as compared to Aleppo governorate (6%, n=4), whereas the number of those who reported using only credit modality was higher in Aleppo governorate (12%, n=8) as compared to Idleb governorate (2%, n=2).

Selling Modalities in the Animal Feed Sector NWS Q1 2021

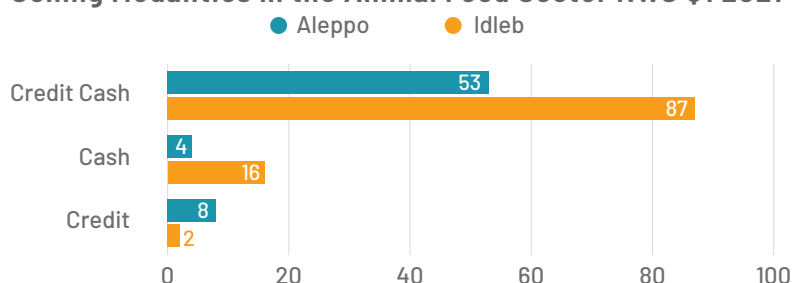


Figure 29: Selling Modalities in the Animal Feed Sector NWS Q1 2021

The United States Dollar was reported to be the dominant currency in buying the raw materials in NWS both in Aleppo governorate (85%, n=64) and in Idleb governorate (75%, n=105). Turkish Lira came next, and the use percentage of TL reported to be higher in Idleb governorate (25%, n=35) as compared with Aleppo governorate (9%, n=7). However, the use of Syrian pound at the raw materials procurement transactions was limited to Aleppo governorate with very low percentage (5%, n=4), whereas none of the interviewed participants in Idleb reported the use of SYP.

Like the raw materials procurement transactions, USD was reported as the main used currency in selling the animal feed products, the use of USD was higher in Aleppo governorate (58%, n=61) as compared to Idleb governorate (48%, n=77). It is worth mentioning that the usage of TL was reported to be similar as USD in Idleb governorate (48%, n=77), whereas usage of TL in Aleppo was limited to 25%, n=26. Syrian Pound reported as the least used currencies in the selling transaction of animal feed products with (18%, n=19) in Aleppo governorate and only (4%, n=7) in Idleb governorate. Furthermore, USD currency has been reported to be the main currency used for pricing and costing. For example, even when the used currency was TL or SYP, the seller sets the price or cost of the sold item in USD and then uses the daily exchange rate to convert the amount to the currency (SYP or TL) that the customer wants to use for paying.

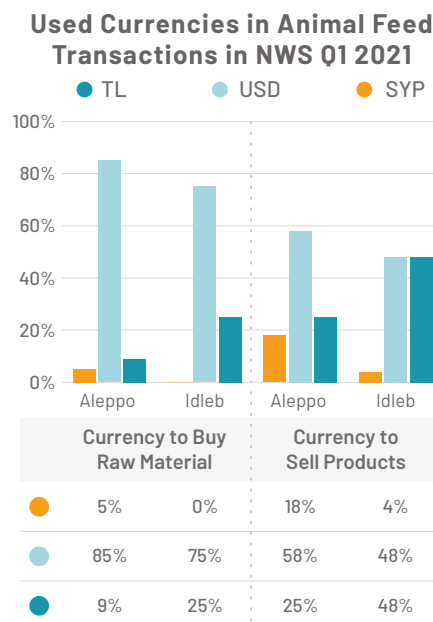
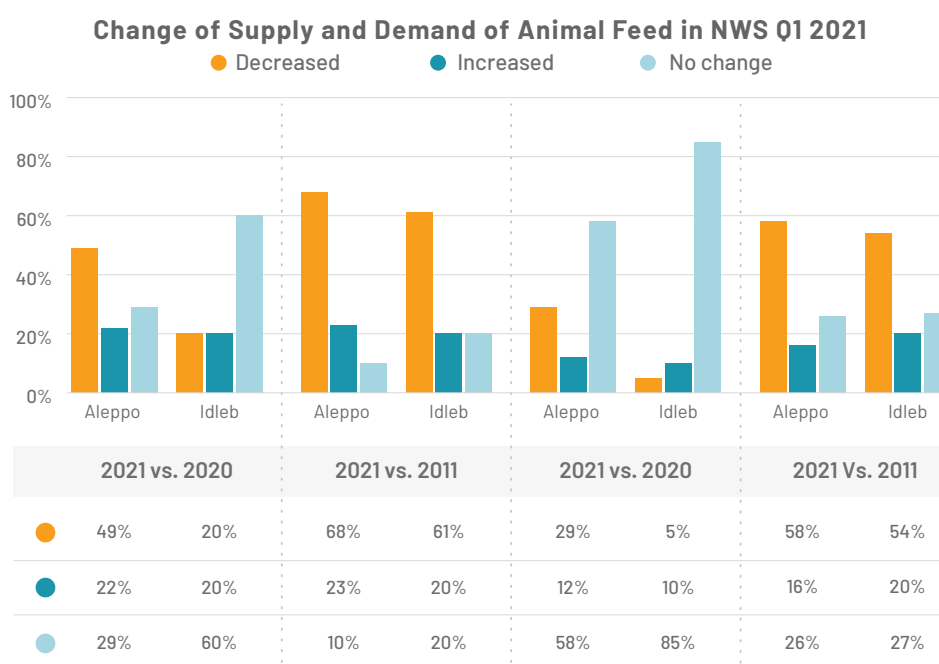


Figure 30: Used Currencies in Animal Feed Transactions in NWS Q1 2021

Data record more stability in the number of customer for animal feed sector in Idleb governorate as compared to Aleppo governorate between 2021 and 2020; more than half (60%, n=63) of the interviewed participants in Idleb governorate reported that there was no change in the number of customers in 2021 as compared to 2020, whereas the a significant percentage (49%, n=32) in Aleppo governorate reported that the number of customer decreased in 2021 as compared to 2020 and percentage of those who reported no change in Aleppo governorate was low (29%, n=19). The percentage of those who reported an increase in the number of customers was quite similar in both Aleppo governorate (22%, n=14), and Idleb governorate (20%, n=21). Comparing between 2011 and 2021, a significant (68%, n=21, in Aleppo governorate, and 61%, n=25, in Idleb governorate) number of interviewed participants reported a decrease in the number of customers.

Similar to the findings on the demand side, data showed higher stability in the number of vendors for the animal feed sector in Idleb governorate as compared to Aleppo governorate between 2021 and 2020; majority (85%, n=89) of the interviewed participants in Idleb governorate reported that there was no change in the number of vendors in 2021 as compared to 2020, where the percentage of those who reported no change in Aleppo governorate was (58%, n=65). In addition, the percentage of those who reported that the number of vendors decreased in 2021 as compared to 2020 in Aleppo governorate (29%, n=19) was 6 times more as compared to Idleb governorate (5%, n=5).

Data recorded that crisis had a significant impact on the supply of animal feed products; by comparing between 2011 and 2021, a significant (58%, n=18, in Aleppo governorate, and 54%, n=22, in Idleb governorate) number of interviewed participants reported a decrease in the number of vendors.



**Figure 31:** Change of Supply and Demand of Animal Feed in NWS Q1 2021

## Warehousing Capacity

The warehousing capacity was reported to be good, where the majority (99 %, n=162) of the study respondents reported that they had a warehouse either in the same workplace (66%, n=108) or a separated warehouse (33%, n=54). The space of the warehouse ranged between 8 and 1500 cubic meters, with an average of 198 cubic meters. The stored quantity ranged between 2 and 2,000 MT per study respondent, and the total stored quantity of animal feed in Idleb governorate (16489 MT) was 3 times more as compared to the stored quantity of animal feed in Aleppo governorate (5194 MT).

## VI. DISCUSSION

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Data recorded that the crisis had a significant impact on the supply chain of animal feed and fodder, thereby negatively affecting the livestock sector and livestock-based livelihoods in Northwest Syria. By comparing between 2011 and 2021, a significant (58%, n=18, in Aleppo governorate, and 54%, n=22, in Idleb governorate) of study respondents reported a decrease in the number of market actors along the livestock feed and fodder value chain. However, it is encouraging to note that the livestock feed and fodder industry is proving to be resilient and adaptive as it is thriving to persist and remain active despite the crisis. Most of both manufacturers of feed and fodder (44%, n=12) as study respondents reported to have been actively in business well after the onset of the Syrian crisis, between 1 to 10 years. Moreover, most feed and fodder traders (46%, n = 57) reported to have been active in business between 1 to 10 years, again that is an indication of growth in business activity of the livestock feed and fodder industry well into the Syrian crisis. Such study findings highlight the notion that, despite all the challenges generated by the protracted crisis, coupled with the impact of years of droughts from 2006 to 2009 and in 2014<sup>4</sup>, 2017/2018 agricultural seasons and the increasing pressure on the country's scarce natural resources, the livestock sector continues to play an essential role in Northwest Syria, where it is a productive pillar of the economy, a key source of livelihoods and a critical economic safety net for the poor households in rural and peri-urban areas<sup>5</sup>. The livestock feed and fodder supply system, though severely weakened, is still in operation and it provides a platform on which to build recovery and resilience, and to mitigate some drivers of distress migration in Northwest Syria. A sustainable and resilience-based approach on livestock-based livelihood programming in Northwest Syria is essential if the efforts of humanitarian and development agencies are to be more than just palliative in the short-term. The livestock sector in Northwest Syria has a meaningful and critical part to play in improving food security and nutrition status and maximizing livelihood opportunities for the crisis-affected people and host communities to move towards achieving some of the sustainable development goals.

Compared to animal feed, the number of market actors who reported producing or trading in fodder is relatively low. For instance, the availability of green fodder including was reported to be limited in both winter and summer seasons across the assessed sub-districts where the majority (55%) reported that the availability of green fodder was not available. Unlike animal feed, most traders reportedly import fodder from Turkey or northeast Syria region. It is reported that availability of animal fodder is limited and with high cost in most parts of Northwest Syria, so NGOs could play a key role by establishing a program to deliver intervention support towards local fodder production and processing. Fodder availability and affordability is critical for sustainable livestock husbandry, so considering sustainable fodder provision as main the intervention responses in Livestock programming across Northwest Syria must be a priority. Local production of raw materials of feed and fodder production can stabilize local prices of animal feeds and fodder while ensuring accessibility and affordability of these important inputs of livestock production. The prices of animal feed and fodder recorded for the summer season were lower as compared to winter for this study. This is likely since during the winter cropping season most livestock units must be kept under control for pen fattening with less free ranging to combat livestock raids on crops. In that regard during winter cropping season with less free ranging of livestock then demand for supplementary feeds and fodder is generally high thus likely triggering price hikes for feeds and fodder. It may be necessary to ensure more humanitarian support on animal feed and fodder throughout the year, given that the dry summer season is characterized by less forage cover exposed to free ranging livestock.

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4 Francesca de Châtel, 2014. The Role of Drought and Climate Change in the Syrian Uprising: Untangling the Triggers of the Revolution, Middle Eastern Studies, DOI: 10.1080/00263206.2013.850076

5 WFP/ FAO. 2019. Crop and Food Security Report for Syria

## VII. CONCLUSION

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The assessment results will inform humanitarian partners focusing on emergency and early recovery responses on the livestock sector and livelihood restoration and its specific needs across Northwest Syria. This assessment provides a better understanding of how the conflict and the 2020 internal displacement of people and their livestock herds in Northwest Syria has affected the commercial viability of the animal feed and fodder market functionality and prices. Based on the study findings several NGOs can base on this evidence to design responses and interventions to revitalize the livestock feed and fodder industry, improve the condition of the livestock herd and livelihood restoration for the vulnerable people in Northwest Syria.

## VIII. RECOMMENDATIONS

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These findings provide directions for future research as well as recommendations that could provide guidance to livestock-based livelihood programming across Northwest Syria.

- Based on services and assistance provided by different actors, it is strongly recommended to improve the coordination between actors, local stakeholders, and humanitarian actors to avoid overlapping, and gaps in supporting the revitalization of the commercial fodder supply industry to ensure the market actors are widely available across NWS with improved accessibility of affordable animal fodder to livestock keepers
- Compared to animal feed, the number of market actors who reported producing or trading in fodder is relatively low. Local farmers can be trained and supported to produce the alternative fodder as a coping strategy to address the lack and shortage of traditional fodder across the market in Northwest Syria. For example, humanitarian partners can upscale and replicate the implementation of livestock support projects to produce new fodder such as: Hydroponic barley, Sudan grass, Azolla and intercropping forage crops between olives' trees in olive plantations across Northwest Syria.
- Consider training humanitarian partners' personnel "as Trainers of Trainees" on Sustainable Agriculture Production of Fodder crops under limited resources with a flare in Climate Smart Agriculture practices. Such training would need to be cascaded to local farmers by humanitarian partners to ensure improved local production of fodder crops.
- Most interviewed market actors (96%) reported that laboratory facilities are not available in their area. Consider training Animal feed and fodder producers on improved livestock feed formulations empowering livestock feed and fodder market actors to produce quality animal feed and fodder from fodder crops, crop residues and forest products and animal vital amines.

### Recommended Further Studies

- Seasonal (bi-annual) assessment of such a study on Commercial Animal feed and Fodder market actors mapping of functionality and seasonality on availability and prices of animal feed and fodder is necessary to inform humanitarian partners and development actors in reviving the livestock sector of Northwest Syria. Such routine mapping exercise is important to continuously identify the feed and fodder supply capacity and gaps, quantifying the impact of crisis on animal feed and fodder processing facilities, impact of imported feed and fodder and distribution of in-kind animal feed on the local market, and inform future projects targeted towards processing rehabilitation facilities.
- It is recommended to conduct seasonal studies to ascertain accessibility and affordability of animal feed and fodder by vulnerable livestock keepers in Northwest Syria. Animal feed and fodder may be available but not affordable by vulnerable livestock farmers.