Global Scientific JOURNALS

GSJ: Volume 10, Issue 10, October 2022, Online: ISSN 2320-9186
www.globalscientificjournal.com

THE PROBLEMS AND CONSTRAINTS FACING DAIRY FARMS PRODUCERS IN GEZIRA STATE CENTRAL OF SUDAN

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KeyWords

limitation, Facing Milk Production, Gezira State, Sudan

ABSTRACT

The contribution of the dairy sector to the total household income is substantial. For Sudan is endowed with good livestock production potential mainly due to relatively fair natural resource availability, suitable climate, and large cattle population. Livestock are raised by pastoralists, agro-pastoralists, crop/livestock mixed farmers and urban dwellers and play a vital role in economic development, particularly as societies evolve from subsistence agriculture into cash-based economies. This study was designed to assess the constrains in milk production in Gezira state, central of the Sudan, mainly focusing on limitation facing milk production and animal factors. The primary data for this study were collected at the village level using questioner from the milk producer households, a total number of target respondents where 120 samples were selected from four localities, Gezira State center of Sudan the study was conducted during the year 2017-2018.The results revelated that there were a highly significant differences (P≥ 0.01) between animal breeds reared in the locality, stock replacement, building materials used for animals housing, practicing milking methods, management systems and there were no significant differences between most of producers practicing subjected in current study. Also, the study was highlighted on some factors related mainly to animal's factors, which affect production of milk and to predict the awareness of producers, about how to make benefit and to raise their income through application of different techniques mainly in dairy animal husbandry in the study area.

INTRODUCTION:

The Sudan is an East Central African country. The country has one of the largest livestock populations in Africa. Cattle, sheep, goats, and camels provide milk and meat for local consumption and meat and live animals for export [1]. Livestock is raised in almost all parts of the country and animals are owned primarily by nomadic tribes. In 2019, the livestock population was estimated at about 109 million heads, comprising about 31 million cattle, 40 million sheep, 32 million goats and 4.9 million camels [2] ..People in Sudan are used to consume dairy products. According to the Ministry of Livestock an estimated 4,8 million ton of milk per year is produced of which 50% is used for direct human consumption and the remaining for bakeries and for feeding young stock. Annually, Sudan imports 20,000 tons of milk powder. When this milk powder import is included in the consumption assessment, consumption of liquid milk is estimated at 71 litres of milk/capita /year [3]. The serious production constraints which were defined by camel owners include lack of feeds, disease prevalence and water shortage. The priority of camel owners for genetic improvement was for a dual-

purpose animal (meat and milk production) rather than a specialized animal. However, racing ability also received some consideration [4]. Despite their importance to the national economy livestock do not receive sufficient attention in government policies and financing. Almost all animals are owned by smallholder farmers or traditional pastoralists. Livestock feed is often in deficit in relation to needs and crop by-products ad range vegetation are fibrous and of low nutritional value. Livestock are affected by a multitude of diseases but receive little health care. Access to finance by producers is difficult and credit is limited and expensive if obtainable. Services to the sector are not adequately funded and are generally poorly equipped. Livestock output is low in relation to numbers and to the sector's potential [1]. The analysis of the determinants of technical efficiency indicated that area, education level, marital status, and experience were the most important factors affecting the technical inefficiency of farmers. To promote milk production technical efficiency, it is recommended improving the environment of cowshed and reduced the cost of feed [5]. The milk from ruminants' animals plays an important role in the nutrition for most people in Sudan in rural and urban areas. Milk production system in Sudan depends largely on the traditional sector, which produces about 80% of the milk consumed in Sudan. Other system includes dairy co-operative societies, private sector farms and modern dairy farms [6]. In Sudan, urban milk supply largely comes from village herds and its marketing is by milk vendors who distribute raw milk to households as the organized dairy establishments are limited [7]. The improper handling of raw milk, problems of transportation and distribution, high temperature, lack of principles of quality control, poor cooling facilities and neglecting of sanitary standards by the distributors are the major impediments [8]. Also the importance of the human factors in explaining variations in farm performance are stressed [9].Sudan, different types of milk production systems can be identified based on various criteria. Milk production systems can be broadly categorized into urban, peri-urban and rural milk production systems based on location [10], while based on market orientation, scale, and production intensity, dairy production systems can be categorized as traditional smallholders, privatized state farms, and urban and peri-urban systems [11].

MATERIALS AND METHODS

Study area:

Gezira State lies roughly in the center of Sudan, south of Khartoum State. It is bordered towards the west by the White Nile State and the White Nile River. On the South it is bordered by Sinnar State and on the East by Al Gadarif State.Gezira state has an area of 27,549 km² Latitude: 14°36'0" Longitude: 33°20'59.99" and Population size of 3,529,992 (ABC, 2008) [12]. The main natural resources/ economic activities declared that, 91.9% of the total area of the Gezira state is agricultural land. Animal wealth is about 8.034 million heads. The main activities of the state are agriculture, sweet factories, and traditional oil factories and many other businesses etc…….. .

Data collection

The primary data for this study were collected at the village level using questioner from the milk producer households, samples were selected from four localities, the study was conducted during the year 2017-2018, the following procedure was used:

From each locality 30 respondents were randomly selected. Thirty milk producer households were selected from each locality to make a comparative study, an equal number of the same respondents were also randomly selected based on the proximity in distance (in km) from each sampled area.

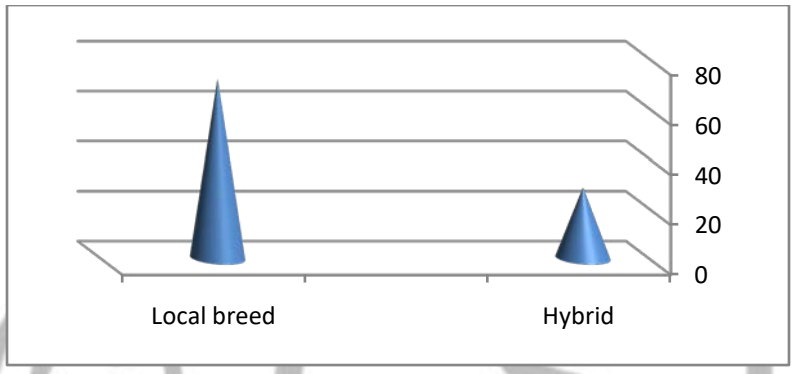
Thus, the total number of target respondents were 120. It is worth mentioning that while examining the dairy farms were selected based on quantitative magnitude of milk production.

Statistical analysis

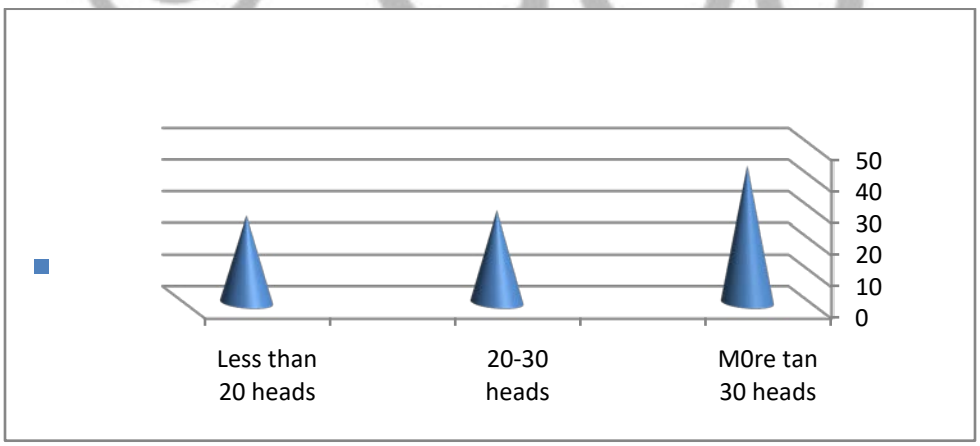
Various methods of data analysis were conducted according to the nature of data collection. Simple descriptive method, matrix correlations, regression, and the General Linear Model (GLM) using the SPSS (Statistical Package for Social Sciences, version17). Differences between means were separated by Duncan's Multiple Range Test (DMRT) when the significant differences existed. A P-value of ≤ 0.05 was considered indicative of a statistically significant difference.

RESULTS AND DISSCISION

Animals' factors according to producers feedback fiuger,1 the different types of dairy animal breeds reared in the study areas in Gezira state.The interviewed respondents explained that, local breeds were dominant in most of the Gezira state with 71.67% while hybrid dairy cows were found in only 28.33% [13], for example reports that the number of crossbred cows is very low and is mainly concentrated in and around major urban and peri-urban centres which was agreed with this study. Tsehay [14], reported about 99% of the cattle population in Ethiopia are indigenous that are adapted to feed and water shortages, disease challenges and harsh climates. There is a highly significant differences between animal breeds reared in the locality at the level (p≥0.01). According to the feed-back of dairy producers, the study showed that, most of producers own more than 30 heads of dairy cattle, with no significant differences.

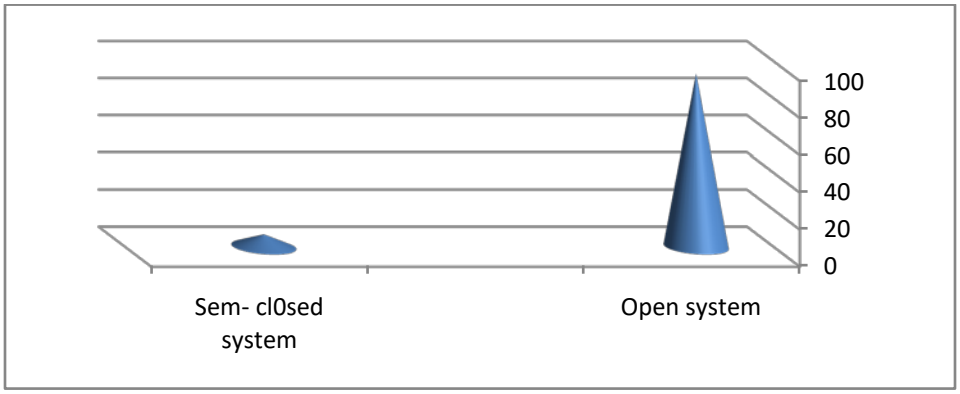


Fiuger,1 the different types of dairy animal breeds reared in the study areas in Gezira state.



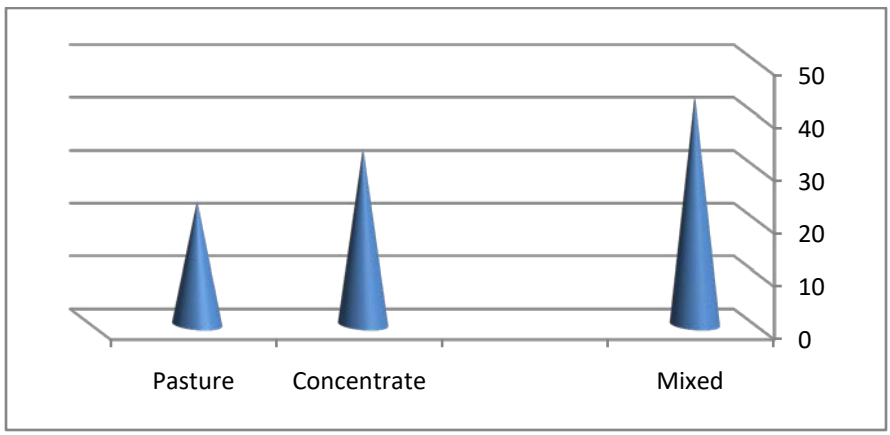
Fiuger.2. The herd sizes owned by producers in the study in Gezira state.

With reference to the rearing or management system followed by dairy animal's owners, the study showed that, semi-closed system is rarely applied in the study area, only a few numbers of farms applied semi- closed system which comprising about 6.67% of the total farms. The study showed significant differences between producers at the level (p≥0.01) in application or following the different management systems.

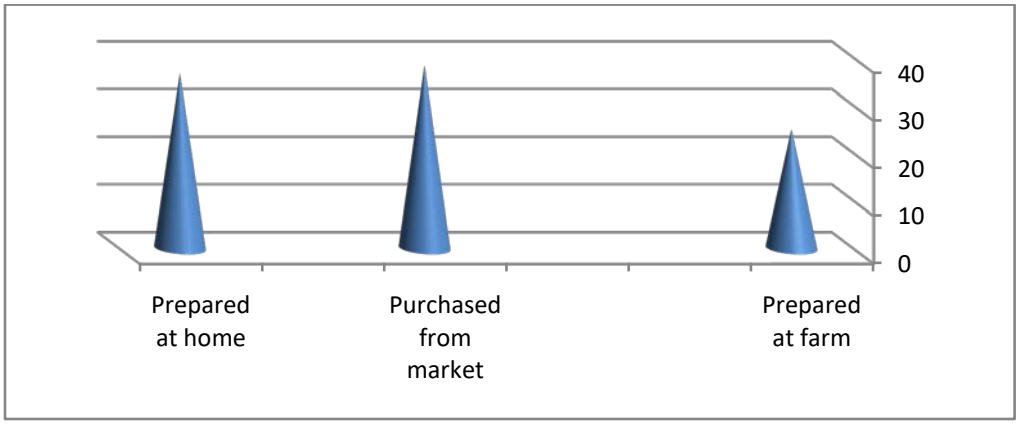


Fiuger.3. The stock rearing or management system followed by dairy cattle owners in Gezira state.

Regarding the feed-back of the respondents (producers) about the source of animal feed, the study showed that most of animal owners in Gezira state with rate of 43.34% depend on mixed feed for animal feeding. 33.33 And 23.33 were depend on concentrate and pasture respectively to raise the production and to maintain animal health. The types of feed and feed resources reported in this study were in agreement with that reported by Tessema Z, *et al*.,;and Yoseph M, *et al*., , [15,16] which indicated that dairy activities are highly constrained by feed shortage, also this result was quoted by Wheeler [17] who reported that the milk yield of dairy cows depends on four factors including genetic ability, feeding program, herd management and health. In Khartoum state Bahri locality Kuku region, most of the producers (69.3%) fed their animals on roughages and concentrates whereas 29.3% of the producers fed their animals on roughages, concentrates and supplementary feed, while only 1.3% fed their animals on roughages only. This disagrees with Habeb Allah [18] who found that the farmers of dairy cattle in Eastern Nile Khartoum fed their animals quantitatively and qualitatively according to availability and price of food in the market, all the above records were agreed to some extent with our study in animal feeding. These finding performed no significant differences between animal owners in using the different types of animal feeds. With regard to the feed-back of respondents (Producers) about how to reach or prepare feed for animals, 38.33% of producers or dairy cattle owners explained that, they usually depend on purchasing ready feed from markets. Sometimes they prepare animal feed at home or market to fill the gap when happened. Some of dairy animal's owners explained that they always depend on home preparing for animal feeds with the rate of 36.67% and others prepare animal feeds at farm with the rate of 25.00%. The study showed that there is no significant difference between animal's owners for feed preparations.

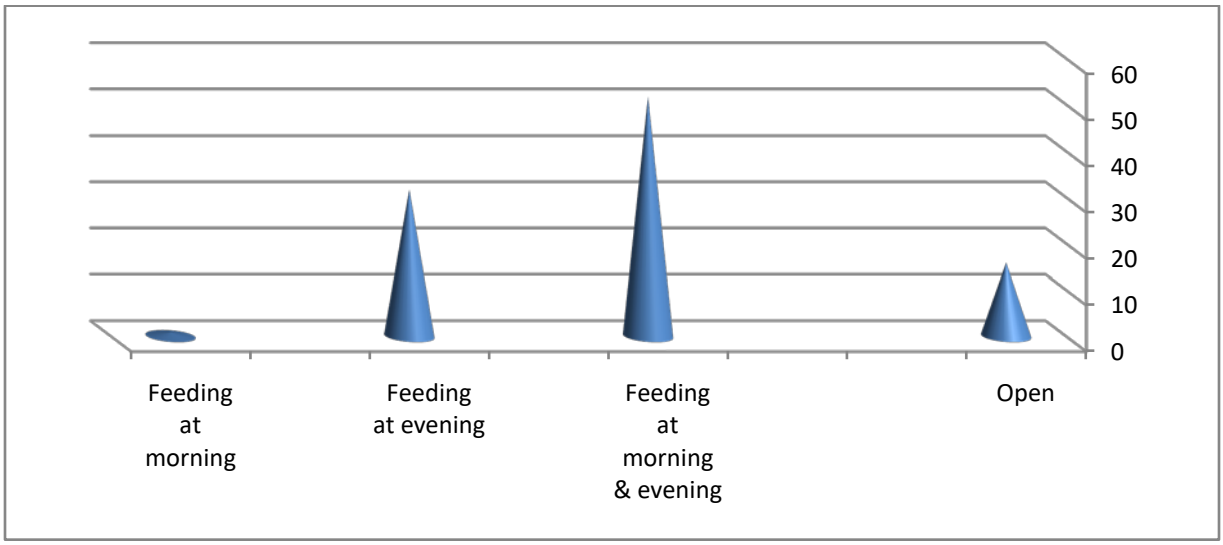


Fiuger.4. The source of feed used by producers, in the study areas of Gezira state.



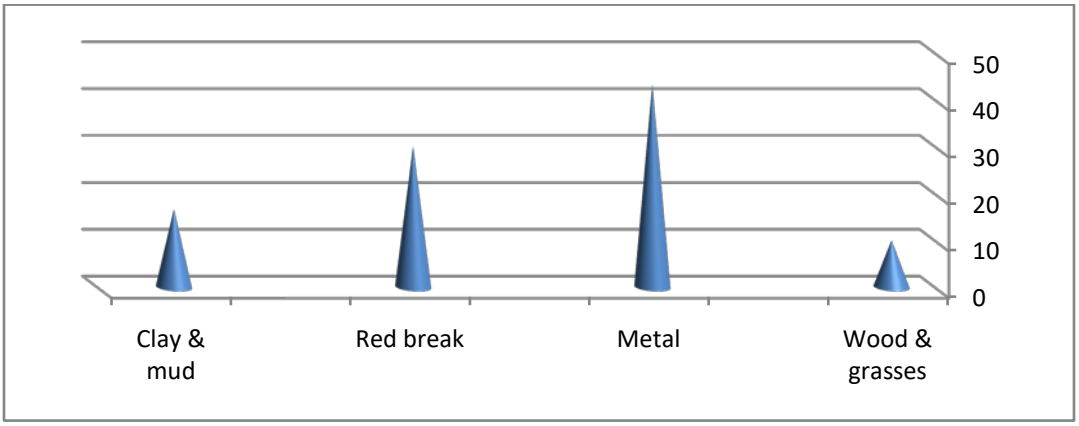
Fiuger.5. The procedures of rations preparation or receiving by producers in Gezira state.

With regard to the feed-back of respondents (Producers) about time of feeding animals , most of dairy animals producers were explained that, they usually deliver feed for animals twice a day at morning and evening with 51.67% and sometimes at evening with 31.67%. Some of dairy animals' owners were deliver feed for animals mostly at morning evening with 0.83%. There are no significant differences noticed among animal's owners for delivering of animal feed.



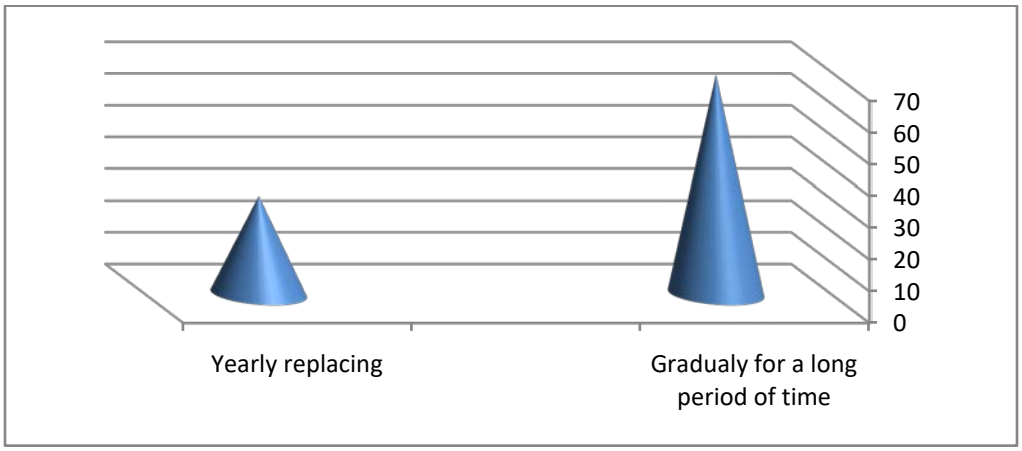
Fiuger.6. The time of feeding animals by producers in Gezira state.

Regarding building materials used for animals housing, most of producers were used metal and red break for housing their animal with 43.33 and 30.00% respectively. The obtained structure of housing was in line with that reported by Ahmed and El Zubeir [19], they reported that poorly designed farm buildings were observed during the survey and ideal building materials were found to be seldom used in the studied areas. These findings in line with that declared by producers in Khartoum state they reported that the farm constructed materials include available materials and some of dairy units are divided into fences for different age groups of the cows. The above results were supported by Kulneff [20] who studied the dairy management system in relatively modern systems in Khartoum State and reported that the animals were housed in pens on the ground, surrounded by either mud walls or iron fences and with access to roofs for shadow. The study showed that there is no significant differences between producers in using red breaks and wood and grasses and there is a highly significance differences between those who used clay and mud and metal at the level ($p \geq 0.01$).



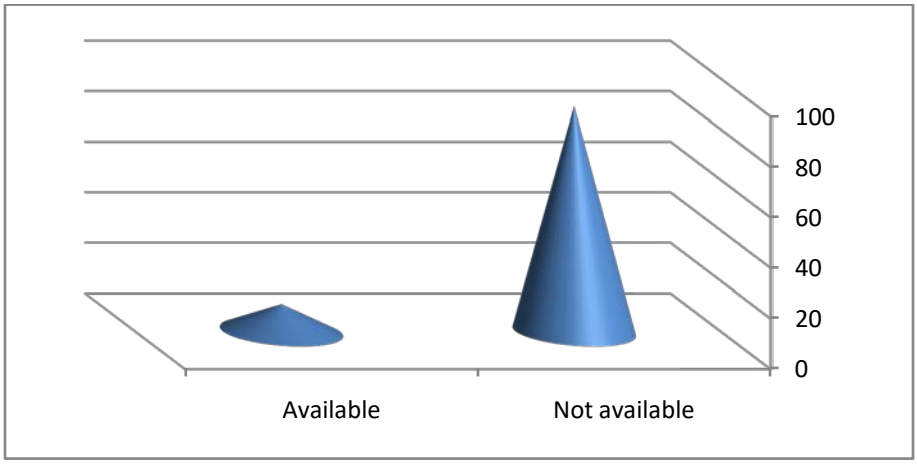
Fiuger.7. The building materials used for housing dairy cattle in Gezira state

For renewing of herd bloods, the study showed that, most of dairy cattle owners (Producers) tend to replace their animals on a long period of time with 69.17% and some of them were showed higher tendency for practicing replacement of their stock yearly. The study showed that there are highly significant differences at the 0.01 level between producers in practicing certain procedure in herd replacement.

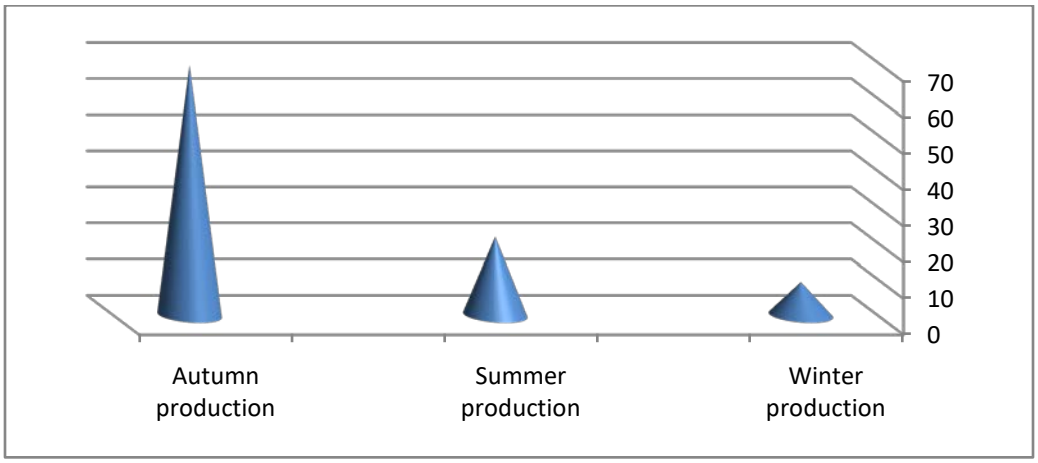


Fiuger.8. The stock replacement procedure followed by dairy cattle owners in Gezira state.

The study showed that, producers depend on other transportation means for dairy products distribution with a rate of 48.34%. Producers explained that, runs (Donkeys) are considered as economical means of transportation for milk with a rate of 40.83% compared to the other means. This result is augmented by the findings reported by Elmagli and El Zubeir [7] who stated that in Sudan, urban milk supply largely comes from village herds and its marketing is mostly by milk venders who distribute raw milk to households on donkeys. Mustafa *et al*, [21] reported that 71.7% of farmers in Khartoum North sold their products at the farm gate homestead. They added that milk supply and marketing are influenced by many factors such as environmental (season), location of the farm with regards to marketing points and the availability of means of transportation which was agree with this study. The study showed there are no significant differences between producers in using the different means of transportation for milk distribution. The study showed that, producers explained that autumn season was better in milk production with a rate of 69.17% compared to the other seasons of the year. The study showed that there are no significant differences between the different seasons in production; this indicates that the nutrition pattern followed does not depend on seasonality.

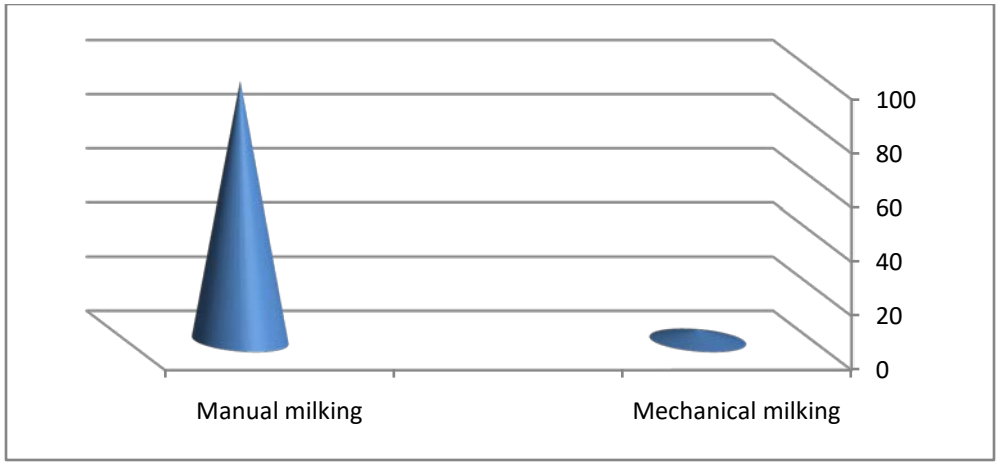


Fiuger.9. The availability of milk transportation means in Gezira state.



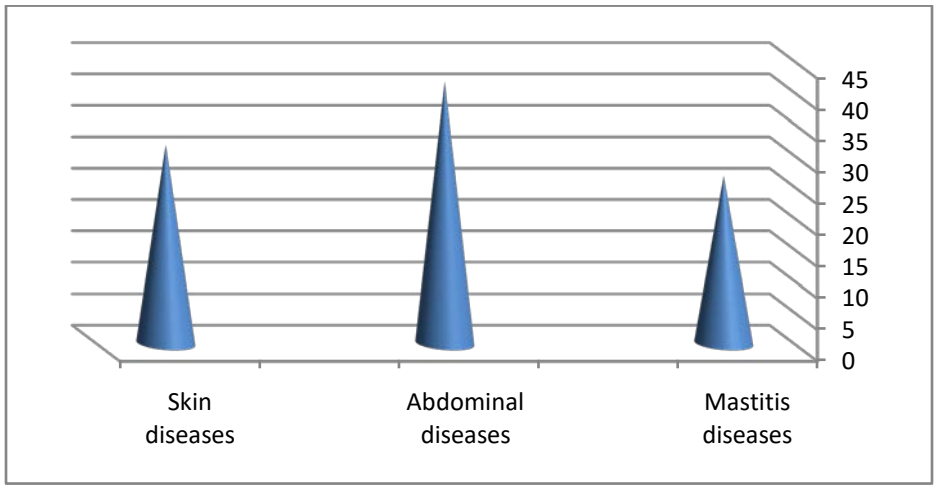
Fiuger.10. The dairy cattle production according to the different seasons of the year in Gezira state.

The study showed that, there is limited practicing of mechanical milking method with a rate of 4.17% from the respondents (Producers) and the majority milking their animals manually with a rate of 95.83%. The study showed that there are highly significant differences at level (p≥0.01) between producer's feed-back in practicing milking methods.



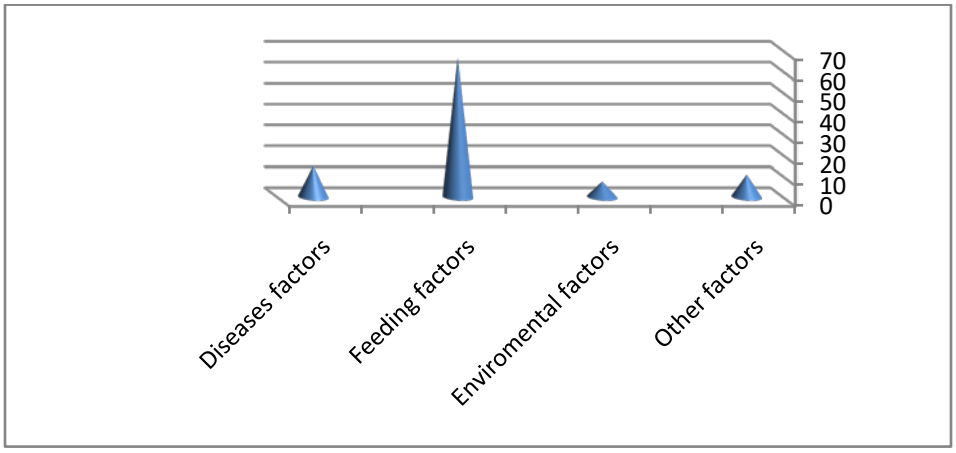
Fiuger.11. The milking methods practiced by producers in Gezira state.

The study showed that, dairy cattle are highly infected by Abdominal diseases, skin diseases and odor mastitis with 41.67, 31.67and 26.66% respectively. The study showed that there are a significant differences at the level (p≥0.05).between skin and abdominal diseases, and no significant differences between the different herds about odor mastitis diseases.



Fiuger.12. The dominant infectious diseases in the study areas in Gezira state.

The study showed that, producers explained that feeding constitute the main constraints for milk production with a rate of 66.67% according to the high cost and shortage of availability of fodders all around the production period. Moreover, this result agreed with FAO, IDF and IFCN, [22] who stated that concentrates were given to dairy herds irrespective of physiological status of the animal. It also goes in line with Musa *et al*. [23] who reported that Kenana and Butana cattle herders stressed the lack of livestock feed to be the most important limiting factor for productivity of their cattle, also he reported that 76.67% of the respondents mentioned that high price of ration constrains livestock production. This agreed with findings of Saeed and Fadel Elseed [24] who reported that animal feed is a major constraint for zero-grazing dairy cattle.This is in accordance with the finding of Mustafa [21] who found that the major constraints for livestock production were high prices of concentrates,. These finding agree with that reported by Saeed and Fadel Elseed [24]. They reported that, livestock keepers in the study area, irrespective of the location in the four regions had listed a wide range of diseases. The percentage of the infectious diseases such as Mastitis, Also Masangi [25] reported that animal feed is a major constraint for zero-grazed dairy cattle.The results also goes in line with the finding reported by Musa *et al.* [23] who reported that Kenana and Butana cattle herders stressed that lack of livestock feed was the most important limiting factor for productivity of their cattle. However, Habeeballa [18] attributed high concentrates prices to export of industrial by-products and high prices of green fodder to seasonal factors. In some cases, especially during fall and festivals low milk prices and high concentrates prices acted as a disincentive, forcing producers to restrict their feeding. Most of dairy animal producers suffer from high cost of feeding, Environmental and other problems arise the least constraints which was agreed with this study. Ibtisam E M El-Zubeir [26] illustrated that herd health, trained labours and availability of feeds are the major problems facing dairy herd owners. Ulfina *et al*., [27] reported that, respondents in Chencha and kucha indicated that shortage of animal feed is the most important problem hindering dairy development. Similarly, the respondents in western oromia reported feed shortage as the most single problems responsible for low milk yield and low productivity of the dairy system, these finding were agreed with that reported in this study. The same author showed that about 58% of the proportions of the respondents indicated feed shortage in combination with diseases and poor genetic make-up of indigenous animals as a primary cause for lower productivity. The study showed that there are no significant differences between the different factors as causing problems and constraints in milk production.



Fiuger.13. The dairy cattle production problems and constraints that facing the producer due to diseases, feeding costs, environment and other problems.

Conclusion

Current study concluded that the results revelated there were a highly significant differences (P≥ 0.01) between animal breeds reared in the locality, stock replacement, building materials used for animals housing, practicing milking methods, management systems and there were no significant differences between most of producers practicing subjected in current study. Also, the study was highlighted on some factors related mainly to animal's factors, which affect production of milk and to predict the awareness of producers, about how to make benefit and to raise their income through application of different techniques mainly in dairy animal husbandry in the study area. The respondents mentioned three major limitations influence the dairy sector which were the high cost of nutrition, disease and lack of new technologies.

Funding: Not applicable

Conflict of interest

None

Ethics Statement: This work was approved by the Ethics Committee of, University of Gezira, Wad Madani, Sudan. The data obtained from this work were analyzed according to guidelines of ethical standards of the Declaration of Helsinki.

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