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Abstract

China is the fifth largest dairy producer in the world and the second largest in Asia. The total revenue of the dairy market in China 359.041 billion yuan in 2017, with a YOY increase of 7.85 percent. The most consumed dairy products in China are fresh milk, milk powder and yogurt, while cheese and butter are less popular. However, the dairy farming in China still faces a number of problems including; poor infrastructure, poor storage facilities, fluctuation in milk prices, delayed payments, expensive feeds, poor marketing system, unfavorable climatic conditions (due to global warming) and inadequate access to credit facilities. The study employed cross-sectional design. Cross sectional research design is appropriate when doing research at a particular time. The study was conducted in Shuangcheng Farm. The target population was 89 dairy where the respondents were the farm managers. Data analysis is the process of systematically arranging field findings for presentation. The study concludes that most farmers lack enough support from the national and county government in proper marketing system and extension services.it further concludes that very expensive feeds increases cost of production thus subsequently reducing profit. Pests and diseases plays are of economic importance in dairy cattle production. Pests and disease causes high mortality rate among the lambs especially during cold and rainy seasons. Dairy farmers require sufficient credit facilities to finance their dairy farming activities. Access to credit facilities for instance access to extension services, access to financial support and dairy equipment is vital in improving milk yield. However, most farmers lack access to affordable credit facilities to buy dairy animal feeds, offer veterinary services and meet other dairy expenses. Dairy feed prices have become extremely risen high in the recent past. Feed costs constitute the major day-to-day expense. The high costs have been further exacerbated by the progressive shift from an extensive to an intensive system of dairy production. The government and should invest more on cattle dairy research and innovation to train farmers in artificial insemination and efficient record keeping. Credit facilities institutions should also reduce the interest rates while giving farmers loans and be flexible in their rules and regulations. Farmers should learn to adopt breeds that are resistant to pests and diseases, invest more on doing research on production and marketing. They also should also adopt to modern production methods.

Keywords: *Production factors, dairy Cattle Farming, Shuangcheng Farm, China*

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1. Introduction

Development of dairy in China was slow before 1978. After the market policy was released up to 1996, the national GDP per capital increased by 12.5% annually (Dong, Ma & Lu, 2020). Then dairy grow very fast after training of dairy farmers on adopting new technology improves milk productivity in China (Gale & Jewison, 2016). In Sr lanka, sustainability dairy production depends on farmer training, collectivizing farmers into farmer societies, culling unproductive male animals, increasing the availability and access to artificial insemination/ other breading programs and low-cost quality concentrate feed and other supplements. Farmers are encouraged to observe these factors so as to achieve self-sufficiency in milk production (Wijethilaka, De Silva, Deshapriya & Gunaratne, 2015). In 2015, Sri Lanka imported 51 per cent of the national milk requirement though Sri Lanka has a great potential to increase its milk production.

United Kingdom (UK) dairy industry accounted for 18% of the total agricultural output in 2015.The number of dairy cows in the UK has declined steadily since 2007 from 3.0 million to 1.5 million in 2015 which a reduction of 20%. Where farm gate milk price rose from 18p/litre in 2007 to 34p/litre in 2015. United Kingdom is the third largest milk producers in European Union. This is after Germany and France and tenth largest in the world. UK produces around 14 billion litres per year and most of this milk is consumed within as liquid milk and dairy products. In 2015 (January- November) around 48% of the milk processed is used as liquid milk and 26% were processed as cheese.

In South Africa, airy production has change as a result of technological advancement, especially in feeding form, milking systems, biotechnology and housing. However, dairy cows are seemingly reducing as a result of decreasing dairy farms (Metcalfe, 2014). Ethiopia has a large livestock population and dairy development owing to her relatively favorable climate for improved, high yielding dairy cattle breeds and regions with less animal disease-stress, however productivity is relatively low, quality feeds that are difficult to obtain, support services that are inadequate and milk marketing system is not well developed (Mihret, Mitku & Guadu, 2017). In Ethiopia, dairy production is constrained by several factors classified as: Technical or biological, socio-economic and institutional factors and others some of the major environmental constraints such as low rainfall, high temperature and low forage production, common plant association, livestock and human carrying capacity, incidence of important livestock diseases and parasites (Getabalew, Tewodros Alemneh & Akeberegn, 2019).

The dairy sector plays an important role in food security, creating employment, generating income, and enhancing the livelihoods of dairy farmers, traders, processors and all participants in the entire milk supply chain (Frank, Huang, Ma & Rozzelle, 2006). The dairy industry in the China is the single largest livestock production sub-sector contributing to 14% of the agricultural gross domestic product (GDP) and 3.5% of the total GDP. However, according to Dong, Ma and Lu (2020) dairy production is affected by various factors that range from production, farming procedures and marketing. China is second leading dairy producers in Asia, however the sector is affected by various challenges that include; poor infrastructure, poor storage facilities, delayed payments, expensive feeds, poor marketing system and inadequate access to credit facilities.

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1.1 Statement of the Problem

China is the fifth largest dairy producer in the world and the second largest in Asia. The total revenue of the dairy market in China 359.041 billion yuan in 2017, with a YOY increase of 7.85 percent. The most consumed dairy products in China are fresh milk, milk powder and yogurt, while cheese and butter are less popular (Dong, Ma & Lu, 2020). The dairy sector faces a number of problems including; poor infrastructure, poor storage facilities, fluctuation in milk prices, delayed payments, expensive feeds, poor marketing system, unfavorable climatic conditions (due to global warming) and inadequate access to credit facilities (Ding, Fu, Zheng & Yan, 2019). These problems affect the productivity of this sector to compete in the domestic and international market (Gooch, Hoskin & Law, 2017). These problems increase production cost thus reducing profit.

1.2 Objectives

1. To determine socio-economic factors affecting dairy cattle production in Shuangcheng Farm, China.
2. To determine breeding methods used by dairy cattle producers in Shuangcheng Farm, China.
3. Identify challenges facing dairy cattle production in Shuangcheng Farm, China.

2. Literature Review

2.1 Socio economic factors and dairy cattle production

There are various socio-economic factors affecting dairy cattle production. Lybæk and Asai, (2017) identified credit access, costs of feeds and infrastructure. Further, Mihret, Mitku and Guadu, (2017) noted that environmental changes, pests and disease and market access affects dairy cattle production.

The availability of credit occupies a central place of development strategies (Jia, 2006). Credit is important in fostering agricultural development. Government and donors spend billions of shillings supporting credit activities in low income countries. Most of these activities are justified by the impact that loans have on ultimate borrowers: credit demand filled, additional crops produced, changes in modern inputs use and borrowers' increased income. This is because in case of nil or poor return from agriculture, farmers can use credit to restart.

Dairy farmers require sufficient credit facilities to finance their dairy farming activities. Access to credit facilities for instance access to extension services, access to financial support and dairy equipment is vital in improving milk yield. However, most farers lack access to affordable credit facilities to buy dairy animal feeds, offer veterinary services and meet other dairy expenses (Gale & Jewison, 2016). Moreover, access to market in terms average prices for milk and transport networks is vital requirement in airy farming. Milk is highly perishable and thus accessing read market is an important necessity in enhancing dairy farming. Access to market is largely defined by good road infrastructure.

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Dairy feed prices have become extremely risen high in the recent past. Feed costs constitute the major day-to-day expense. The high costs have been further exacerbated by the progressive shift from an extensive to an intensive system of dairy (Gooch, Hoskin & Law, 2017). farmers need to be knowledgeable on how to maximize productivity while minimizing costs of feeding.

Dairy farmers perceive that pests and diseases may pose severe adverse impact on dairy production. As a result, milk quantity and quality are severely diminished due to pests and infectious diseases. Insect and mite pest activity results in lowered milk production levels and reduced feed conversion efficiency. It exposes cattle to pathogenic microorganism and causes blood loss and hides damage. It can lead to public health–public nuisance concerns. Further, environmental changes brought by short or even prolonged drought conditions and famine may result to low milk production. Adverse environmental changes may result to inadequate natural feed and declining water levels for the dairy cattle.

2.2 Breeding methods and dairy cattle production

Breeding methods used by the farmer contributes to the productivity. Modern methods of breeding are applied to boost the production. AI and natural service are main methods of breeding. Access to AI services within a country depends heavily on geographical location, being more widely available near cities or 'milk pockets' and being less available in areas with low farm density. Options in the absence of AI are natural service through the use of a community bull (usually at no cost), one's own bull, or privately-owned bulls for which fees must be paid to the owner. Selecting breeding is vital in improving milk production. Breeds are created by selecting traits they particularly liked in dairy cattle that is associated with higher milk production.

Breeding for more sustainable milk production involves the optimization of breeding programs to ensure that there is a balance between production, animal health and welfare, and the surrounding environment. Breeding goals in dairy cattle often include many economically important traits which increase the genetic gain in production traits, and functional traits as well (Mark, 2004), and in this way the existing breeding goals increase the profitability (Groen, 2008; Steine et al., 2008). Still, further development of breeding goals is necessary to achieve sustainability in milk production. Operational breeding, efficient and systematic strategy are needed to bring about any considerable progress in the dairy sector.

2.3 Challenges facing dairy cattle producers

The dairy industry is facing new challenges arising from the growing public interest in animal health and welfare, and the impact of milk production on the environment. At the same time production costs are increasing, while revenues from milk sales remain very low. Dairy cattle farmers are facing many challenges in form of constantly increasing production costs, competition on the market and public concern about animal welfare and the environment. The main breeding objective traits in dairy cattle were obtaining better milk yield (Godadaw et al., 2015 and Zewdu, 2004) and in addition increasing milk yield. The SDFs therefore continue to face challenges in accessing formal credit facilities which would enable them to enhance dairy farming techniques and generally their overall output due to various factors which maybe market related, individual based or institutional factors.

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3. Materials and Methods

The study employed cross-sectional design. Cross sectional research design is appropriate when doing research at a particular time. The study was conducted in Shuangcheng Farm. The target population was 89 dairy where the respondents were the farm managers. A census of all 89 farm managers was conducted. The study employed semi-structured questionnaires to collect primary data. Questionnaires are appropriate when doing study over a large population over large area. Questionnaires were delivered to farm managers and have them filled in person. Data analysis is the process of systematically arranging field findings for presentation. Data collected was analyzed using SPSS version 21 based on the themes of research objectives. The statistical test to analysis of factors affecting dairy cattle production in Shuangcheng Farm was analyzed through descriptive statistics and content analysis for open ended questions.

4. Research Findings, Interpretations and Discussions

The study administered 89 questionnaires to farm managers in Shuangcheng Farm, China. Response rate showed that out of 89 questionnaires administered to the farm managers, 79 questionnaires were successfully filled and returned. This represented 89.76% response rate which is adequate for descriptive study.

4.1 Demographic information

Income sources

The study sought to identify the other sources of income. Multiple sources of income are important in sustaining dairy farming in purchasing animal feeds and seeking veterinary services. The results are presented in Figure 1.

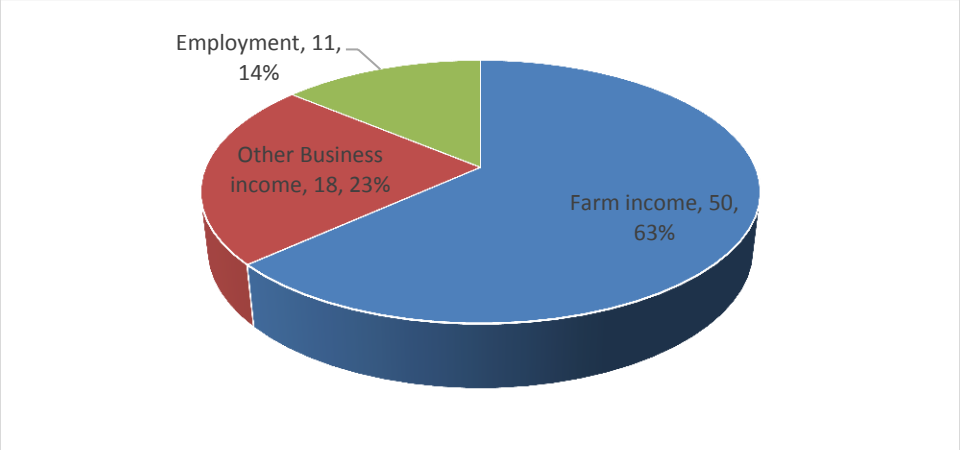

Figure 1: Income sources

The results in Figure 1 indicate that the most common source of income among farmers in Shuangcheng is farm income. Other notable sources of income are employment and businesses. Income is important in acquiring dairy animal production input like feeds and veterinary services.

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Size of your land

The study sought to know the average size of land in acres under dairy farming production. Land is an important factor of dairy production. The results are presented in Table 1.

Table 1: Size of your land

statistic	Minimum	Maximum	Mean	Std. Deviation
Size of land in acres	0.2	22	3.6371	4.89416

The results in Table 1 show that average land size under dairy farming in Shuangcheng is 3.6371 acres. The largest dairy farm was 22 acres while the smallest was 0.2 acres. Land is a vital factor influencing dairy cattle production. Land act as grazing field and also in planting animal feeds.

Breed of dairy cattle common in Shuangcheng Farm

The study sought to know the common breeds of dairy cattle owned by farmers in Shuangcheng Farm. Type of breed is key determinant of the average amount of milk produced. The results are shown in Figure 2.

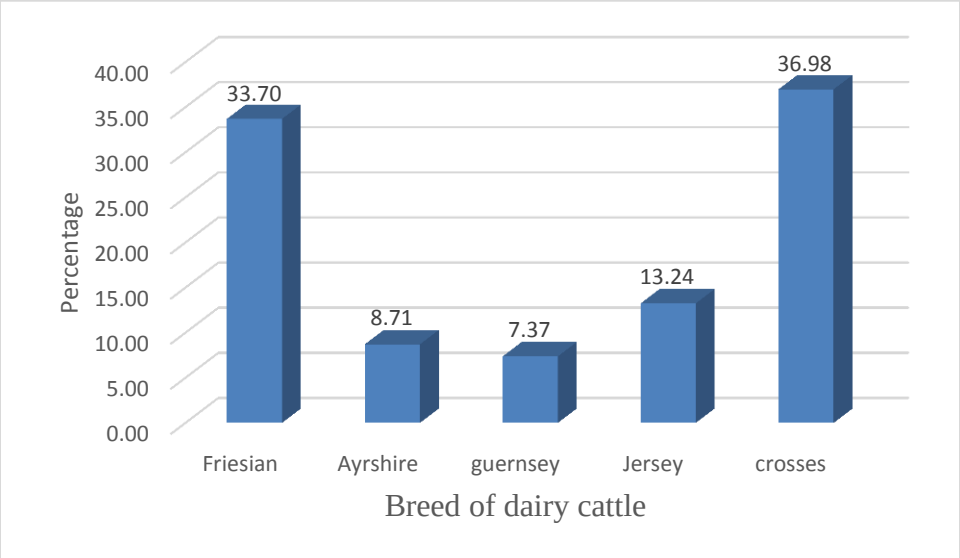

Figure 2: Breed of dairy cattle

The results in Figure 2 indicate that there are more crosses and Friesian breed of dairy cattle in Shuangcheng. Other common breeds of dairy cattle are Jersey, Guernsey and Ayrshire. The type of dairy cattle breed determines the amount of milk produced. Table 3 also shows the number of dairy cattle breeds in Shuangcheng.

Table 2: Breed of dairy cattle

Breed of dairy cattle	Number of cattle in the farm
Friesian	832
Ayrshire	215
guernsey	182
Jersey	327
crosses	913

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Table 2 indicated that there were 913 crosses and 832 Friesian breed of dairy cattle in Shuangcheng. Other common breeds of dairy cattle are Jersey, Guernsey and Ayrshire. The type of dairy cattle breed determines the amount of milk produced. The average daily milk production was 67.4 litres in Shuangcheng. Most dairy farmers had practiced dairy cattle farming for more than 10 years.

4.2 Credit Access and dairy cattle production

This study sought to know the availability of credit facilities in Shuangcheng. Readily available credit enables farmers to increase their production. The results are as shown in Figure 3.

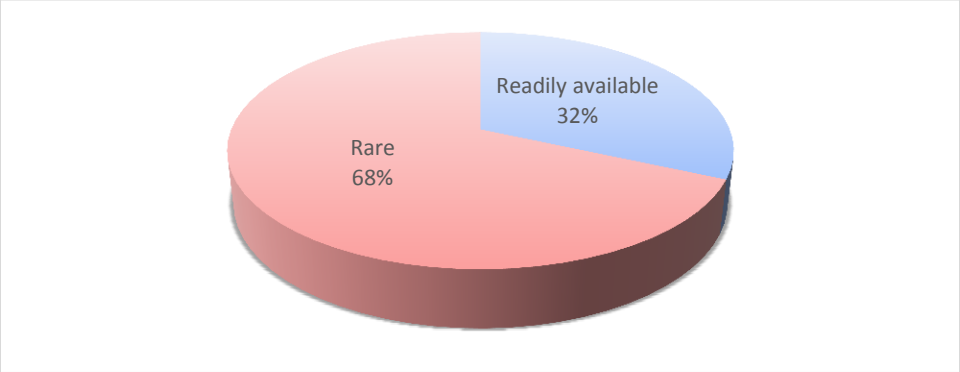

Figure 3: Are there credit facilities in your area that help dairy farmers

Fig 3 indicated that credit facilities availability is rare in Shuangcheng Farm. This is because of high interest rates charged by the by the credit facilitators. Availability of credit facilities at lower interest rates enhances cattle dairy production because of controlled pest and feeds availability. Sufficient amount of credit is important in enabling cattle dairy production for instance purchasing feeds and treating pests and diseases.

4.3 Access to Market and cattle dairy production

This study sought to know market accessibility by dairy cattle farmers in Shuangcheng Farm. Readily available market for dairy cattle producers enables them to sell their output in time thus maximum profit. The results are illustrated in the table 3.

Table 3: Accessibility to market for milk

Accessibility to market for milk	Frequency	Percent
Very accessible	9	11.4
accessible	18	22.8
fairy accessible	44	55.7
not accessible	8	10.1
Total	79	100

The results in the table 3 shows that market for dairy cattle products is fairy accessible due to poor marketing system by government. Good market accessibility enables farmers to sell their produce timely and efficiently thus more profit. Proper marketing system enables them to sell their mil efficiently and timely thus more profit. Most farmers prefer to sell their milk directly to local vendors and dairy milk due their better pay and timely payment.

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4.4 Pests and diseases and dairy cattle production

This study sought to know common commons pests and diseases affecting dairy cattle production. The most pests and diseases affecting cattle dairy production in Shuangcheng are: anthrax, foot and mouth disease (FMD), rinderpest, pox, rabies. These diseases increases production cost due to high treatment cost and subsequent death of animals leading to losses.

4.5 Costs of feeds and dairy cattle production

The study sought to now the how the dairy cattle production is affected by expensive feds in Shuangcheng farm. Very expensive feed leads to increase in cost of production thus reducing the profit. The results are as shown in Table 4.

Table 4: Extent of the effect of expensive feeds on dairy cattle production

Extent of the effect of expensive feeds on dairy cattle production	Frequency	Percent
Very great extent	11	13.9
Great extent	34	43
Moderate extent	15	19
Little extent	10	12.7
No extent	9	11.4
Total	79	100

The results in the table 4 show that dairy cattle production greatly affected by expensive feeds. Many farmers agreed that dairy cattle dairy production is greatly affected by expensive feeds while few farmers noted that expensive feeds affects cattle production. Available feeds lead farmers to feed their cows properly thus encouraging maximum production.

4.6 Common challenge on breed and production in your farm

This study sought to know the common challenge on breed and production in Shuangcheng farm. The results are shown in the table 5.

Table 5: Common challenge on breed and production in your farm

Common challenge on breed and production in your farm	Frequency	Percent
Diseases susceptibility	35	44.3
Repeat On Estrus	11	13.9
Dystocia	10	12.7
Adaptability	9	11.4
Silent Heat	11	13.9
None	3	3.8
Total	79	100

The result in Table 5 shows that frequency of disease susceptibility is higher compared to other factors diseases susceptibly leads to lower production due to higher cost of production and treatment. Maximum dairy cattle production can be achieved through close cooperation among government, farmers and credit lenders. Their close association will lead to win-win result thus maximum profit.

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5. Conclusions

The study concludes that most farmers lack enough support from the national and county government in proper marketing system and extension services.it further concludes that very expensive feeds increases cost of production thus subsequently reducing profit. Pests and diseases plays are of economic importance in dairy cattle production. Pests and disease causes high mortality rate among the lambs especially during cold and rainy seasons.

The availability of credit occupies a central place of development strategies. Credit is important in fostering agricultural development. Government and donors spend billions of shillings supporting credit activities in low income countries. Most of these activities are justified by the impact that loans have on ultimate borrowers: credit demand filled, additional crops produced, changes in modern inputs use and borrowers' increased income. This is because in case of nil or poor return from agriculture, farmers can use credit to restart.

Dairy farmers require sufficient credit facilities to finance their dairy farming activities. Access to credit facilities for instance access to extension services, access to financial support and dairy equipment is vital in improving milk yield. However, most farmers lack access to affordable credit facilities to buy dairy animal feeds, offer veterinary services and meet other dairy expenses. Moreover, access to market in terms average prices for milk and transport networks is vital requirement in airy farming. Milk is highly perishable and thus accessing read market is an important necessity in enhancing dairy farming. Access to market is largely defined by good road infrastructure.

Dairy feed prices have become extremely risen high in the recent past. Feed costs constitute the major day-to-day expense. The high costs have been further exacerbated by the progressive shift from an extensive to an intensive system of dairy production. farmers need to be knowledgeable on how to maximize productivity while minimizing costs of feeding.

Dairy farmers perceive that pests and diseases may pose severe adverse impact on dairy production. As a result, milk quantity and quality are severely diminished due to pests and infectious diseases. Insect and mite pest activity results in lowered milk production levels and

6. Recommendations

The stakeholders in dairy cattle production should work together in order to reduce production cost and increase output. National and county government should work together and help farmers in subsidizing the prices of inputs like feeds. The government and should invest more on cattle dairy research and innovation to train farmers in artificial insemination and efficient record keeping.

Credit facilities institutions should also reduce the interest rates while giving farmers loans and be flexible in their rules and regulations. Farmers should learn to adopt breeds that are resistant to pests and diseases, invest more on doing research on production and marketing. They also should also adopt to modern production methods.

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