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Research Paper

Assessment of Pre-Weaning Management Practices In Small Scale Dairy Farms in Benadir Region, Somalia

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ABSTRACT
Crosses sectional study was conducted in Benadir region, Somalia between August 2020 and March 2021 to assess the pre-weaning management practices in small scale dairy farms in Benadir, Somalia. A questionnaire was collected to 60 dairy farm owner and attendants.
It was reported that the main factors affecting the preweaning calves in the study area was mastitis, diseases (diarrhea) and environmental problems (rainy season) which is one of the most effective factors which disturbed the calves to be well-being. A moiety of the respondents, (50%) addressed that the major effect of rainy season on the calves was stress. On the other hand, 47% of the respondents indicated that the most appropriate season for calf weaning was spring (Gu'). Pre-weaning and calf management is one of the main factors which are thoroughly affects the production and profitability of the country. This study will help the farmers and animal rearing society to deal with the factors which are opposing and lowering their production in Benadir, Somalia. Also it enhances the awareness of the farmers to encourage their production.
KEYWORDS: *Dairy cattle, weaning, nutrition, colustrum and calf.*

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I. INTRODUCTION

The pre-weaning management of dairy calves over the last 30 years has focused on mortality, early weaning and rumen development. Recent studies suggest that nutrient intake from milk or milk replacer during the pre-weaning period alters the phenotypic expression for milk yield. Calf management programs have traditionally focused on strategies that restrict the amount of milk or milk replacer offered to the calf, to encourage grain intake in an effort to accelerate weaning, reduce the potential for scours and other illness and reduce the cost of feeding and management (Anderson et al. 1987).

Livestock is the leading economic sector in Somalia where animal production and marketing (both domestic and export selling) have persisted, despite over two decades of civil war and instability. (F. Wanyoike, 2015). The livestock sector in Somali accounts for 40% of the gross domestic product (GDP) and 80% of foreign exchange earnings. At the household level, over 65% of the population is engaged in various ways in the livestock industry. Income earned from animal sales and other livestock related activities is used to buy food and other necessities, thus impacting directly on food security and poverty. (FAO, 2012).

Calves are often subjected to an array of husbandry practices which may compound their stress at the time of weaning. Additional husbandry practices can include; frequent handling and contact with humans, mixing with unfamiliar cattle, movement to new environments whether it be indoor housing or unfamiliar paddocks, switching to different, entirely solid diets, transportation and marketing. Some cattle may also undergo additional processing such as vaccinations, dehorning and castration. (Weary et al., 2008).

II. RESEARCH METHODOLOGY

1.1 Purpose Of The Study

The purpose of this study is to study the pre-weaning management practices in small scale dairy farms in Benadir region

1.2 General Objective

The general objective of this study is to assess the pre-weaning management practices in small scale dairy farms in Benadir, Somalia.

1.2.1 Specific Objectives

i. To evaluate the factors effecting colostrum intake and pre-weaning nutrient intake.
ii. To determine the factors effecting pre-weaning survivability of dairy calves.
iii. To carry out the environmental factors on pre-weaning management in small scale dairy farms.

1.3 Research Questions

i. What are the factors effecting colostrum intake and pre-weaning nutrient intake?
ii. What are the factors effecting pre-weaning survivability of dairy calves?
iii. How the environmental factors effect the pre-weaning management in small scale dairy farms?

1.4 Significance Of The Study

Livestock contributes a highly percentage of Somalia GDPs, therefore; pre-weaning and calf management is one of the main factors which are thoroughly affects the production and profitability of the country. This study will help the farmers and animal rearing society to deal with the factors which are opposing and lowering their production in Benadir, Somalia. Also it enhances the awareness of the farmers to encourage their production.

1.5 Scope Of The Study

The recent study discovers the basics and challenges of weaning management in Benadir region, based on August 2020 to March 2021. An observational study was conducted which utilizes questionnaire to collect the data.

3.1 research Design

The researchers of this study considered structured survey as an appropriate method of the study. Quantitative data analysis was used to test the variables in this study and the primary data was collected by using questionnaires. Since the cross-sectional survey is cost and time effective and data can be gathered just once perhaps over a time constraint period to answer research questions, it was adopted for the purpose of this study.

3.2 Target Population

Population can be defined as the entire group of people that the researcher wishes to investigate (Sekaran, 2003). The population of the study was dairy cattle farmers and villages in Kaaraan, Dayniile and Hodan districts in Benadir region for both exotic and indigenous which are reared as a commercial dairy performance. The study population was 71 people composing of farmers and villagers in Benadir region as a case of surrounding villages.

3.3 STUDY AREA: this study is carrying out in Benadir region specially Kaaraan, Dayniile and Hodan districts.

3.4 Sample Size

The researchers used the following Slovin's statistical formula to calculate the desired sample size.

The Slovin's formula: $n = \frac{N}{1 + N(e)^2}$

Where *n* is the required sample size, *N* is the target population size and *e* is the standard error or level of significance which is popularly known to be =0.05 or 5%. For this study, N = 71 and so the sample size was calculated as follows:

$$n = \frac{71}{1 + 71(0.05)^2} = 60$$

The sample was consists of 60 respondents. The researchers are distributing the sample size for selected farms in Benadir region.

This survey was delivery to each of 60 large farms which are rearing dairy cattle. These farms are located in Benadir region, Mogadishu Somalia.

3.5 Sampling Procedure

Non-probability sampling procedure called Purposive sampling was used in this study. The reason is that respondents who are eligible to participate in this study are purposively chosen as a target respondent of the study.

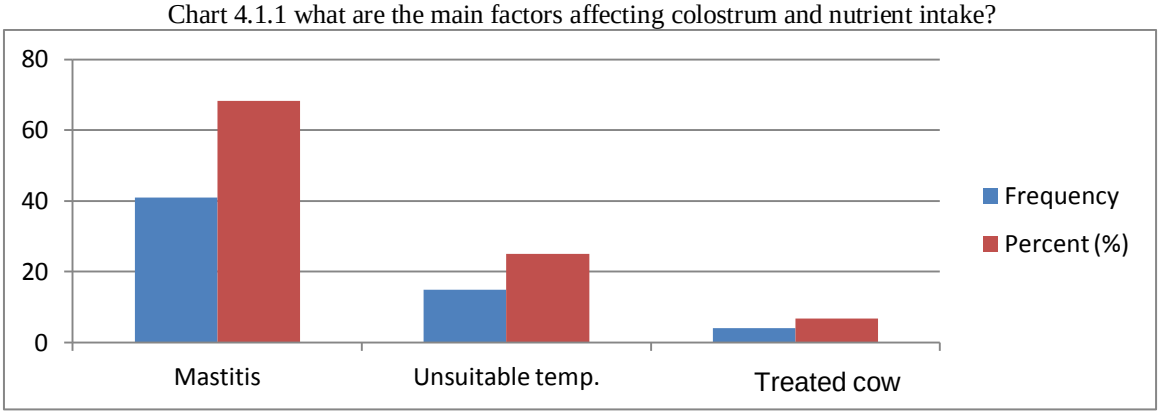
3.6 Data Collection Tool

The study was used questionnaire method to collect the data from the sample chosen because the questionnaire can be used to collect the information related to the feeling and attitudes of the people. Therefore the selection of this instrument is guided by the time available to conduct this research, research questions and objectives of this study.

III. RESULTS, DISCUSSION AND RECOMMENDATION

4.1 section A. objective one: To evaluate the factors effecting colostrum intake and pre-weaning nutrient intake.

Chart 4.1.1 what are the main factors affecting colostrum and nutrient intake?



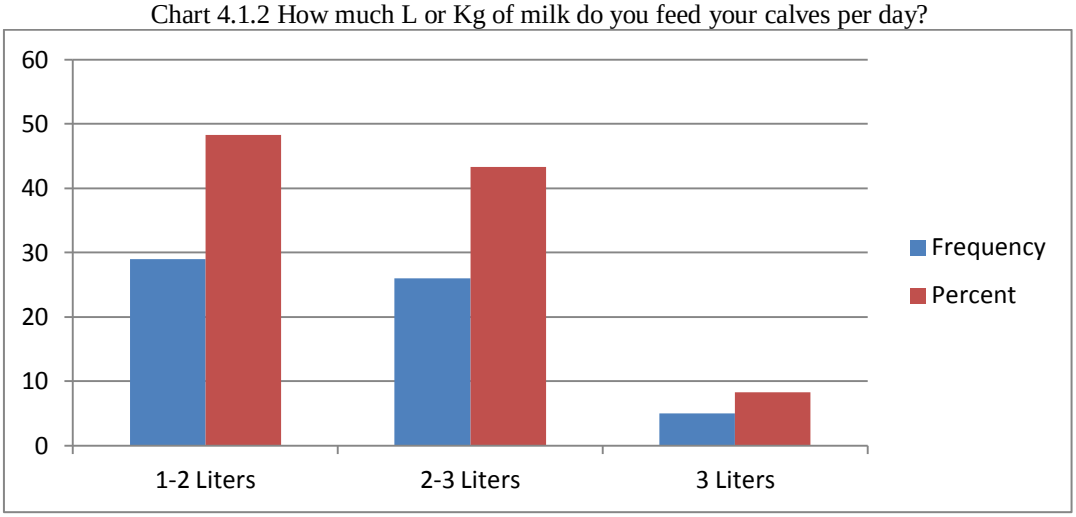
The above Chart 4.1.1 describes that the majority of the respondents 41 (68%) said that the main factors affecting colostrum and nutrient intake were mastitis, also 15 (25%) were said unsuitable temperature while only 4 (7%) said treated cow.

Table 4.1.1 what type of milk do you feed your calve?

Type of milk	Frequency	Percent (%)
Dam milk	53	88.3
Powder milk	7	11.7
Total	60	100.0

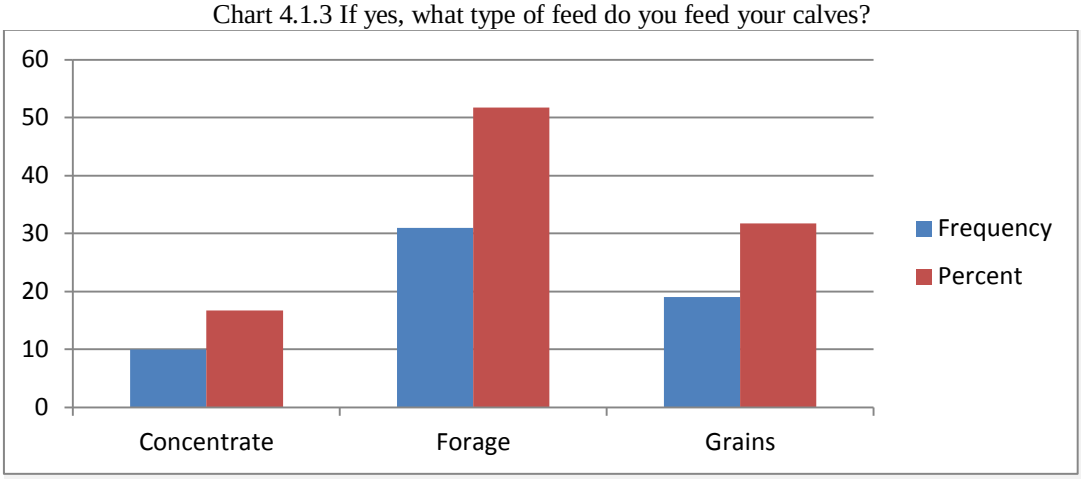
Table 4.1.1 describes that the majority of respondents 53 (88%) said that the type of milk they fed their calves are dam milk while the 7 (12%) fed their calves powder milk.

Chart 4.1.2 How much L or Kg of milk do you feed your calves per day?



The above chart 4.1.2 indicates that the majority of respondents 29 (48%) said that the amount of milk they feed their calves per day is 1-2 Liters, Also 26 (43%) of respondents said that the amount of milk they feed their calves per day is 2-3 liters while 5 (8%) said 3 liters.

Chart 4.1.3 If yes, what type of feed do you feed your calves?



The above chart 4.1.3 indicates that the majority of the respondents 31 (52%) said that the type of feed they give their calves is forage, also 19 (32%) of the respondents were said grains while the 10 (17%) of the respondents were said concentrate.

4.2 Section B. objective two: To determine the factors effecting pre-weaning survivability of dairy calves.

Table 4.2.1 Is there an impact of rainy season on calves?

Effect of rainy season	Frequency	Percent (%)
Yes	60	100.0
NO	0	0.0

Table 4.2.1 shows us all the respondents 60 (100%) said that there is an impact of rainy season on calves.

Table 4.2.2 If yes, how can impact?

Impact of the rain to calves	Frequency	Percent (%)
Stress	30	50.0
Decreased of milk consumption	22	36.7
Both A and B	8	13.3
Total	60	100.0

The above table 4.2.2 describes that half of the respondents 30 (50%) said that the effect of rainy season on their calves was stress, whereas 22 (37%) were said decreased of milk consumption and 8 (13%) said the effect of the rainy season on their calves was both stress and decreased of milk consumption.

Chart 4.2.1 The most appropriate season(s) for calf weaning.

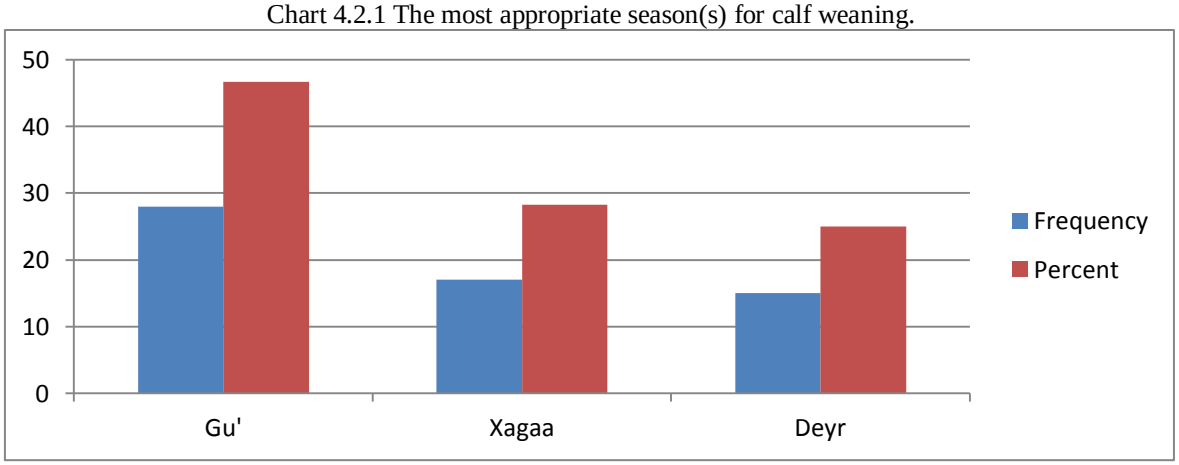


Chart 4.2.1 indicates that the majority of the respondents 28 (47%) said that the most appropriate season for calf weaning is Gu', also 17 (28%) said Xagaa while 15 (25%) said Deyr season.

4.3 Section C. objective three: To carry out the environmental factors on pre-weaning management in small scale dairy farms.

Table 4.3.1 The most common diseases that affect calves.

Diseases effect calves	Frequency	Percent (%)
Diarrhea	45	75.0
Calf pneumonia	10	16.7
Both A and B	5	8.3
Total	60	100.0

The above table 4.3.1 indicates that the majority of the respondents 45 (75%) said that the most disease effects their calves is diarrhea, also 10 (17%) of the respondents said calf pneumonia and 5 (8%) of the respondents said both diarrhea and calf pneumonia.

Table 4.3.2 Using medication to diseased calves.

Using Medication	Frequency	Percent (%)
Yes	45	75.0
No	15	25.0
Total	60	100.0

This table 4.3.2 represents that the majority of the respondents 45 (75%) were accept that there is medication to new calves when they are diseased while 15 (25%) of the respondents were did not accept that.

IV. DISCUSSIONS

The majority of the farmers indicated that the most disease effect their calves was diarrhea and cause deaths due to less hygienic and general mismanagement of the farm such like prevention of calf sour, amount of colostrums feeding, water quality and farm hygiene. Compared to the National Animal Health Monitoring System (NAHMS) for U.S. dairy (2007) reported that (57%) of weaning calf mortality was due to diarrhea and most cases occurred in calves less than 1 month old (USDA, 2007).

Also a similar mortality rate (53.4%) for dairy calves due to calf diarrhea was recently reported in Korea (Hur TY et al, 2013).

The majority of the respondents (68%) said that the main factors affecting colostrum and nutrient intake were dairy subclinical mastitis. (88%) which are the major of the respondents said that the type of milk they fed their calves were dam milk, because the majority of farms were subsistence. However feeding untreated mastitis milk can facilitate the transmission of infectious pathogens and provoke disease in calves. Also subclinical mastitis during lactation period resulted in reduced milk production that is way major dairy farmers are production low quantity of milk as you compare others.

According to the amount of milk they feed their calves per day were 1-2 Liters. During the pre-weaning period all the respondents were agreed that they give feed to their calves and the majority of them, (52%), said that the type of feed they give their calves were forage, because the forage is less cost and available throughout the year while cereal grains and other concentrates were highly cost and less availability. Actual time here in Benadir, there no more exist any food processing industries and feed miller that would help the farmer to get a plenty crop residue and by-products in order to feed their dairy cows. All the respondents said that the criteria of weaning calves from their mother was age based, because there were no other alternatives such like body condition, body weight measurement or scale.

Due to the poor management of farm most of cow urine that contains high levels of nitrogen and dairy cows' manure usually produce greenhouse gas emission and untreated waste from the farm operations creates air pollution, which can cause odors, health problems and can diminish the quality of milk and milk products as well as the life of people who live nearby and lower property values, therefore, The most respondents, (77%), believed that the effect of air pollution to their calves was respiratory diseases mainly calf pneumonia.

V. CONCLUSION AND RECOMMENDATION

CONCLUSION

Dairy farming constitutes an important part of the Benadir Region smallholder dairy sector, which plays a crucial role in the economic development of the country as a source of feed and income and making it one of the biggest potential producers of milk and milk products.

Preweaning average daily gain greatly affects lifetime heifer performance. Colustrum management is the most important factor for calf health and lifetime performance. Early weaned calves can achieve adequate rates of growth if given access to a high quality ration. By the time 3 to 4 months of age, they are consuming significant amounts of forage.

According to the pre-weaning management of dairy calves, there were no surveys conducted in Benadir region, Somalia, due to many challenges involved i.e. lack of knowledge about strategies of pre-weaning management, improper management of colostrum and energy intake of pre-weaning calves

RECOMMENDATIONS

1) Feed colostrum immediately for young calves following birth.
2) Ensure calves are fed high protein concentrate formulations, not the same as for milking cows.
3) Make sure early consumption of dry feed to the calves in order to stimulate rumen maturation.
4) Provide regular cleaning and disinfection to prevent contaminants that may compromise calf health, leading to high calf mortality.
5) Develop constant vaccination for young calves to prevent the possible upcoming diseases.
6) Develop animal health protocols for pre-weaned calves with local veterinarian.
7) Follow recommended Best Management Practices (BMP) for all aspects of calf management such as feeding, housing system, sanitation, ventilation and rearing young calves.
8) Encourage staff to be involved in monitoring health and performance of calves during their daily work routines and writing observations down.

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