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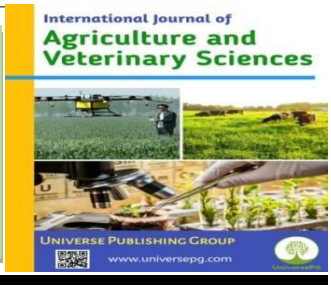

The Effect of Feed Supplementation on Cow Milk Productivity and Quality: A Brief Study

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ABSTRACT

Milk and milk products are an important source of food that provides nutritional energy, protein, minerals, and vitamins of high quality. Feed supplementation could be an excellent way to improve nutrient digestibility and absorption in dairy cattle, resulting in higher milk output and productivity by addressing the cow's nutritional needs through a feeding schedule. Whatever improvements in the genetic makeup of local dairy cows, they only account for about 30% of productivity; the remaining 70% depend on nutrition, appropriate supplementary diet, and other factors management (Garamu, 2019). Supplementing diverse kinds of feedstuffs and giving a well-adjusted diet has a major effect on milk yield and productivity, but not on milk quality. However, milk production efficiency affects milk quality because of the efficiency of nutrient absorption as described by ingestion of dry matter. The ability to maximize milk productivity can be determined by the ingredients formulated in the feed supplement. However, local milking cows are minimal milk outcomes since the shortage of nutritional quality and unavailability of feed, if smallholders use appropriate supplementation of different feeds and improve the nutritive values of feeds for dairy cows, the production, and quality of milk from dairy cattle should increase as well.

Keywords: Milk production, Cow milk productivity, Milk quality, High quality, and Feed supplement.

INTRODUCTION:

Dairy production plays a vital role in the livestock sector and the national economy, with an increase in domestic product (Azage *et al.,* 2013). This sector is basis of livelihoods for a vast and widely held proportion of the rural population in relation to consumption, income generation, and employment. Furthermore, Milk and milk products are an important source of food and contributors to dietary energy requirements, protein, minerals, and vitamins of high quality particularly in vegetarian diets for human (Górska *et al.,* 2019). Ethiopia is known for the leading live-stock numbers in Africa (Metaferia *et al.,* 2011). Out of 70 million, the female cattle consist about 56% and the remaining 44 percent are male cattle. Dairy cows are estimated to be around 7.56 million and milking cows are about 15.04 million heads (CSA, 2020).

Although for the large dairy cattle population, milk production per cow per day is very low in Ethiopia which has great importance for human consumption. Inefficient nutritional and management practices, the

low genetic potential of indigenous cows, high disease and parasitic incidence, poor access to extension and credit services, inadequate information to improve animal performance, lack of feed availability and poor nutrition during the dry season, and a lack of high-quality feed supplementation are all factors contributing to low productivity (Zegeye, 2003; Asaminew and Eyasu, 2009; Aynalem *et al.,* 2011; Yilma *et al.,* 2011; Getahun, 2012; Belay *et al.,* 2013; Abdi, 2022). Milk provided for humans is predicted to rise over time with the increasing world population thought global and a greater income (Martono *et al.,* 2016; Hayle *et al.,* 2020; Eshetu *et al.,* 2019).

The changes in nutritional ingredients for animals generally and for dairy cattle, in particular, are therefore directed at enhancing the milk productivity of an individual with increased availability and higher nutrient use efficiency of energy, protein, and other essential nutrients (Tripathi, 2014). High energy complements like fat and oils are mixed into animal diets, while protein sources of better amino acid composition that are extracted at higher levels for milk synthesis are used in dairy cow feed (Multari *et al.,* 2015; Miri *et al.,* 2013). Technologically producing feed which hydroponic feed are high improvement of digestibility and degradability of the nutrients in the feeds, which could increase milk productivity (Abdi, 2022). Energy supplementation is used in milking cows to increase milk production per cow, stocking rate and milk yields per unit of land, improve forage use with a higher stocking rate, maintain length of lactation, and milk protein content (Kellaway and Porta, 1993).

Supplementations are adding a xylanase-cellulase enzyme solution to a dairy cow's total mixed rations based on alfalfa hay and silage reported a possible rise in milk productivity (Lewis *et al.,* 1999). Others also stated that the practice of bovine Somatotropin, thrice daily milking, and long day photoperiod can increase milk yield (Rigout *et al.*, 2002; Dohoo *et al.,* 2003). Improved circulating glucose may have supported increased lactose synthesis and therefore milk yield because lactose is the osmotic regulator for the mammary glands' uptake of water (Rigout *et al.,* 2002). Milk production efficiency could be interpreted as one kilogram of milk yield from one kilogram of dry matter consumption by an animal, where the optimal values range from 1.4 to 1.8 milk production efficiency was increased. Milk production efficiency values could optimize dry matter intake through feed supplements that can improve the digestion and ab-sorption of nutrients (Rigout *et al.,* 2002). This could be associated with the building blocks formulation of feed supplement as a basis of tannins, saponin, coconut cake, minerals, urea, and molasses that can help maximize the production of microbial protein in the rumen so that the use of more efficient roughage and nutrient supply to the host's intestinal utilize increases, particularly in the fermentation process and digestion of nutrients. Exogenous feed enzymes help to enhance fiber digestion in the rumen, which might lead to enhanced feed exchange efficiency (Gammada, 2020; Holtshausen *et al.,* 2011).

Some feed supplements contain combinations of materials such as non-protein nitrogen slow-release, legumes, molasses, minerals, and vitamins. Tannins might protect amino acids as protein by passing through rumen absorption at exact amounts (Ismael, 2019). Rumen microbes used a cheap basis of protein fodder that could be used constantly all time by the rumen microbes and were corresponding with the energy expenses of the ruminant. Fiber use in the rumen would be former effective and would provide nutrients to the intestine. Raw materials, vitamins, and syrup, also increase the productivity of milking cows because they are utilized by rumen microbes for assisting in the method of highly digestibility and fermentation formations (Abrar *et al.,* 2020).

The Most important of these reviews was to combine different feed supplementation for milking cows to improve milk fabrication and productivity with significant feeding practice necessities. Other feed supplements which having amino acids and even seaweed feed have good nutritional value for ruminants, especially for milking cows' to the improvement milk in order to increase their productivity during dry seasons (Syarwani, 2008; Hutjens, 2005). Micro minerals supplements like as cobalt, selenium, and zinc are maximize the activity of rumen microorganisms and improve the digestibility of feed (Uhi, 2005). Consequently, based on the diverse literature more deliberations of relevant information about supplementary feeding for a dairy cow is imperative to maximizing

milk production. Therefore, the aim of these reviews was to understand the effect of feed supplementation on cow milk productivity and quality in Ethiopia.

Define and concept of supplementary feed for dairy cattle

Supplementary feed is any stuff supplementary to the total feed of the animal to raise the nutritional value of the feed and to raise the level of a sole nutrient or compound nutrient. During dry seasons, there is usually adequate low-quality fodder, which milking cows did not use effectively. Supplemental feeding tries to make appropriate use of this fodder by giving individual nutrients that lack pasture that allows animals to be kept on a budget while choices are made. The potential of supplements to provide more glucose, protein, minerals, and other nutrients to milking cows is well known (Moran, 2005). These supplementary feeds includes; protein supplements (legumes, oilseed, meat meal, fish meal), mineral supplements (salt (sodium), limestone (calcium), bone meal (calcium and phosphorus), vitamin supplements (natural and synthetic), and energy supplement which consist fat and carbohydrate feed those the high amount of energy and low roughage level and high digestibility with high protein content (kayo, 2019). Additionally, supplemental feeding is only an option when compound feeding is available. Survival feeding should be performed if paddock feed availability is limited. Survival feeding means feeding the animals with the minimum amount of food they need to survive (Paterson, 2007). Dietary supplements are a semi-concentrated source of one or more nutrients used to improve the nutritional value of feeds that rise milk productivity in milking cows.

Effect of supplementation on production performances of milking cows with grassing

Supplementary feeding of grazing cows decreases pasture dry matters intake while increases total dry matters intake. The value of the replacement rate indicates a decrease in pasture dry matter consumption. In early lactation, milk output of high-producing grazing dairy cows increases linearly when concentrate intake increases from 1.8 to ten kilograms per day, with a milk response of one kilogram per day, whereas milk response is lower in late lactation (Bargo *et al.* (2003). Cows allocate more nutrients to milk production early in lactation, so milk response to supplementation may be higher than later in lactation, when more nutrients are diverted to body weight. As milk output improves, as does milk fat and protein yield, as concentrate supplementation increases, although milk fat percentage declines. 8.7 kilograms of maize supplementation for grazing milk cows (Stojanovic, 2014)

Supplementing dairy cow feed for milk production in Ethiopia

The main goal of a dairy cow feeding routine based on feed supplements is to maximize milk productions by addressing the cow's nutrient requirements (Bach and Cabrera, 2017). The dietary necessities of milking cows are mostly determined by the total of milk produced, which is in turn determined by the stage of lactation. Pregnancy and maintenance are two more factors that influence nutritional requirements dairy cows (Haile, 2020; Kebede, 2009).

The total upkeep required is mostly determined by the cow's weight, ambient temperature, and activity. Because milk production follows a curve (lactation curve), the sum of nutrients needed will vary depending on where on the curve you are (King *et al.,* 2006). During the dry time, the goal of feeding nutrition is to promote the fast-growing fetus, energy storage, and mammary gland regeneration (Lukuyu, 2012).

Furthermore, when compared to altered types of unsupplemented meals, feed supplements can improve milk produce by 20.88 percent and 8.07 percent, respectively. The consequence of 4% fat-adjusted milk return was equivalent to the result of 0% fat-adjusted milk yield (Martono *et al.,* 2016). Complemented dairy cows produce a suggestively higher milk yield than those fed on natural grassland alone (Kebede, 2009).

In additions to this crossbred cows fed urea treated teff straw and wheat straw, respectively and provided with supplemented diet had significantly higher milk product than for non-supplemented animals of cross bred cows (Mesfin *et al.,* 2009; Getu, 2008). Feed supplementation of milking cow milk output in various areas varies according to management practices. The following **Fig. 1** depicts a variation of feeding supplements on crossbred in various parts of Ethiopia, as well as their milk output.

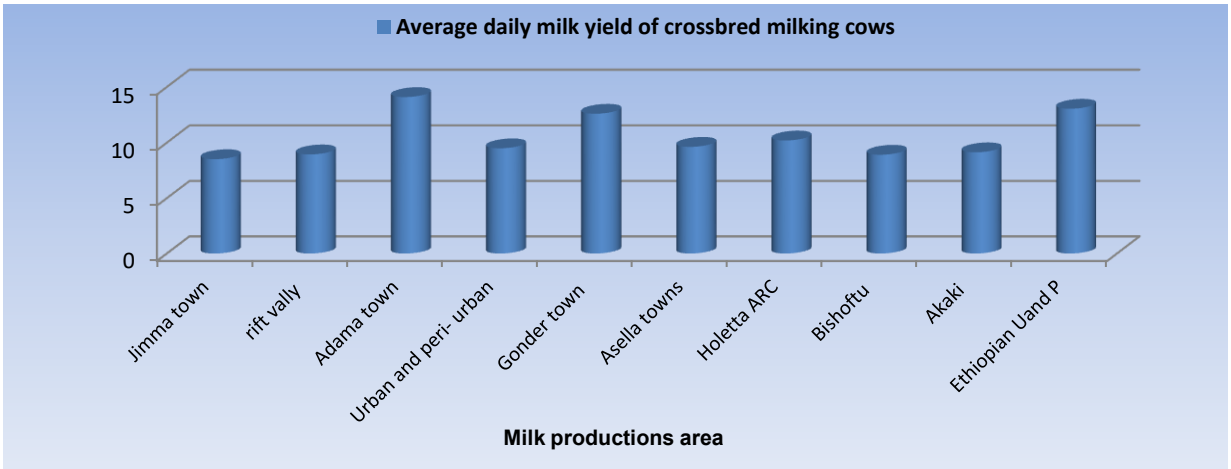

Fig. 1: The average daily milk yield of crossed dairy cows produced in various parts.

Composite different feed to maximize dairy cow productivity

Animal feeding practices in Ethiopia generally rely on local grassland and crop leftovers (Hassen, *et al.,* 2010). Crop wastes, including teff, barley, wheat, oats, and cereal straws Stover's from sorghum, corn and haulms from pulse crops such as peas, beans, lentils, chickpeas, and vetch, are valuable feed supplies (Kebede, 2009). However, seasonality feed supply, and a un-availability of green grass is one of the principal reasons for animal nutrition deterioration (Kebede, 2009; Hassen *et al.,* 2010). They are poor in minerals and have low crude protein, digestibility, and consumption (Kebede, 2009). Rumen efficiency, rumen micro-fauna, and milk cow performance all suffer as an outcome of the reduced nutritional load. Lactating cows, for example, are unable to meet their nutritional requirements, i.e., they lose heaviness and body condition during lactation due to high nutrient demand for milk production. If fed well, 20-25% more milk could be produced from the same livestock (Herrero *et al.,* 2016).

Feed complement would be balanced in terms of quantity and quality of concentrate amounts, protein, mineral, and vitamin content intended for a well and useful cow. Napier grass, Boma Rhodes, Lucerne, desmodium, and sweet potato vines are examples of fodder. Desmodium and Napier grass are best intercropped, gathered, and provide for dairy with each other. Based on specific productivity, a milking cow would supplement 3 kg of concentrates (dairy meal) every day after calving. Increase the milking cow rations to an appropriate level to challenge the dairy product more. When the quantity of helpful bacteria grows, the sum of microbial protein produced also increases. This, when combined with higher net energy, result in improved milk yields and production. After milking, the cow would be supplement dairy food to keep her standing until the teat canal shuts. This helps to prevent mastitis and teat infection. To maximize milk output, farmers should add yeast to their dairy cows' diets. The addition of yeast to a dairy cow's diet improves feed digestion, intake, and whole performance and production. Yeast extracts boost the extent and action of rumen microbial, resulting in a faster rate of gastrointestinal fermentation & a higher net energy output (Lukuyu *et al.,* 2012).

Types of Fodder complements for milking cow

The milk productions outcome from different authors show that early milk yield after supplementation plays a positive role in sustaining and improving milk production after the initial feeds supplementation. When compared to initial milk production, milking cow without complementary feed exhibited a lower milk yield of 0.70 kg/day. Furthermore, some report show that increased milk production necessitates from dairy cow by the use of high crude protein diets supplementations (Law, 2009; Martono *et al.,* 2016). The value of feedstuff consumed has an effect on milk output as well. The potential of supplements to provide more calories, protein, fiber, minerals, and vitamins to milking cows is classified. Concentrates, stored fodder, fodder crops, and by-products are all examples (Dalley, 1997). Energy consumptions are more effect

on milk output than protein (Mekuriaw *et al.,* 2020). Supplements designed with rich protein sources such as coconut meal and non-protein nitrogen (NPN), as well as the energy sources cassava and molasses, have a greater effect on milk output than controls.

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levels compared to other feeds (Tonamo, 2016). Most grains are low in calcium and can be important when feeding huge levels of grain early in lactation, where milk fever is a highly problem. The return of milk to supplementary feeding varies greatly where these Responses depend on lactation, supply quality, pasture quality, pasture substitution, and sto-rage density (Castle and Gil, 1983). Fat supplements Fat is a concentrated form of energy containing up to 35 MJ/kg Dry Matters. Some farmers cook fats and tallow in grain-based concentrates. Milk's response to fat supplements is on the imperative of three liters of milk, with every one pound of fat increasing the fat test by 0.3%. Since the limited ability of animals to digest fat in the lower gastrointestinal tract, there is an upper limit to the usage of bypass fat. When using bypass fat, the total dietary fat should not exceed 7%.

Fat comes from the following sources: one over three (plant source, Vegetable oil, and one Bypass fat). The addition of fat to a dairy cow's feed generally increases milk yield (when feed energy is limited) and increases milk protein yield, but milk protein concentration usually decreases by little percent. The metabolic processes that contribute to this reduction in milk protein concentration have received considerable attention, but the mechanism may still be unknown (Schingoethe, 1996; Wu and Huber, 1994). Rumen-protected fat supplements have a positive effect on milk production when concentrates are added at a level of less than 4-kilogram dry matter/day milk yields smaller than thirty kilograms per day (King *et al.,* 1990). Farmers in industrialized countries often give fat supplements to provide extra energy, but some fats are specially treated to bypass rumen digestion. The amount of fat in the lumen can cover fiber in the feed and reduce fiber digestion if you eat too much. It was fed to high-yielding cows above 30 Liter per day early in lactation (Moran, 2005).

Protein supplement

The nutritional value of some high-protein dietary supplements is urea, cereal legumes, and animal and plant protein meals. Urea is a popular source of nitrogen, nonetheless, it is not a protein. It has no energy value and can be 100% degradable within the rumen. It is primarily used as a substitute for the actual protein source in feed mixes and pellets. Urea is only effective when supplied in a mixture with energy bases such as grain fruits and corn silage. It is recommended that urea only be fed to animals that have a fully functioning rumen and at a maximum rate of 1 percent of complete dry matter ingestions. Grain legumes are multipurpose; they are good sources of both energy and protein. However, their protein is very degradable in the cattle stomach. Fish meal has the highest supply of un-degraded protein and a good balance of amino acids for milk production. Protein meals from plants generally have only moderate levels of un-gradable protein. The amino acids supplied in the protein of oilseed meals do not match the requirements of lactating cows the amino acids are supplied from animal sources. According to feeding research in Australia, milk outputs from protein supplements can be up to one point five liters per kilogram complement, which is significantly higher than milk responses from equal weights of cereal grains. When energy is first constrained, the outputs are often drastically lower. In most cases, energy is the primary constraint to milk production from tropical pastures (Royal and Tseffery, 1992). Protein supplements offer equivalent milk responses to an identical amount of cereal grains when energy is limited, and extra nitrogen is transformed into ammonia and expelled as urea. The protein level of the diet becomes limited for milk production as the energy supply from cereal grains increases. With very small alterations in yield, proteins supplementation can enhance milk production (Kayo *et al.,* 2019).

Mineral supplements

In providing good dairy farmers should consider minerals in addition to protein, energy, water, and others nutrients when feeding their cows. Minerals are essential for optimal reproduction, immunity, and cow's milk, even though they are only required in small amounts (Moate, 1987). Minerals are classified into two classes based on how much is required. Macro minerals are needed in greater quantities, whereas micro minerals are needed in lower quantities. The macro minerals needed include calcium, phosphorus, magnesium, potassium, sodium, chloride, and sulfur. Required trace minerals include iron, cobalt, copper, manganese, zinc, iodine, and selenium. Micro minerals are obtained by cows from the fodder intake (Yadessa, 2015). However, feed & grains do not deliver enough feed, because to meet the level of requirements mine-

rals should be added to the ration. For example, a lack of selenium can lead to retained placenta. These mineral supplements are taken by various parts of Ethiopian dairy farmers.

The amount provided and the animal species given this mineral need further study for proper ration prescribing. Similarly, the report of Belay *et al.* (2012) stated that the majority of dairy cows were supplemented with common salt in West Shewa Zone. Additionally, in eastern Ethiopia, it is also acceptable to provide dairy cattle with minerals such as salt, which provides to animals during the rainy season (Berihu *et al.,* 2014). Milk production was most affected by the ingestion of minerals when there were balanced supplements (Hall, 2019). Minerals should only be replenished if the deficiency is corrected. The percentage of farmers using other mineral sources for dairy cattle feeding in the highland was higher than in the mid and lower land, which might be because of the readiness of the mineral sources in that particular area (Hall, 2019). Therefore, supplementing essential minerals to dairy cow feeds increases milk productivity.

Forage and fodder conservation for milking cow

Because rain-primarily based totally pasture and fodder manufacturing is seasonal, there are instances of lots and instances of scarcity (Mugwika, 2019). It is accordingly vital to preserving the extra to be used in instances of dry season scarcity. The aim of conservation is to reap the most quantity of dry depend from a given vicinity and at the surest level for usage through animals. It additionally permits for a re-increase of the forage (Mubiru *et al.,* 2013). The important methods of holding fodder are through making hay or making silage and barely in fodder financial institution form (Anderson, 1981). Fodder vegetation has the prospect to be a vital complement to pastures over the summertime season and autumn. Some dairy farmers have additionally sown fodder vegetation in autumn to try and fill the iciness feed gap. Some forage vegetation may be poisonous at sure degrees of development.

Therefore, their grazing controls take to be mentioned with nearby dairy officials and consultants. In the previous, oats have been the handiest fodder crop generally grown as an iciness feed, regardless of the fact that they're now no longer nicely tailored to grazing. Now it miles not unusual place exercise to over sow paddocks with annual ryegrasses or to sow ryegrasses as a feed crop due to the fact they're higher tailored to grazing through cattle (Moate, 1997)

Silage supplements

Silage is a type of high-moisture fodder that is kept via fermentation in an oxygen-free environment. These are fodders that, if left to dry, would lose their quality. Grass, fodder sorghum, green oats, green maize, or Napier grass can all be used to make silage. Stages of harvesting: When Napier grass reaches a height of around one meter and has a protein level of around ten percent, it is ready to harvest. Corn and millet should be collected when the grains are in the batter phase, or when it is milky. Corn and millet grains have enough water-soluble carbohydrates at this point. When ensiling Napier grass, however, molasses must be added to raise the sugar level & increase silage quality (Kumar, 2019). If pasture is limited low pasture allowance corn silage supplementation to cows grazing may boost milk output; however, if pasture is available adlibitum high pasture allowance milk production may not alter or may decline (Stojanovic *et al.,* 2014). Various types and amounts of hay supplementation reduced pasture dry matter intake, but the effect on total dry matter intake was dependent on the Substitution rate values: with a lower Substitution rate (0.33), maximum dry matter consumption enhanced, and with a higher Substitution rate (0.81-0.97), higher dry matter feeding was related (Bargo *et al.,* 2003).

Effect of feed supplementation on the milk quality

Supplementation of different feeds increases the content in milk like as fat, protein, solid not fat, comp-lete solids, concentration and lactose (Martono *et al.,* 2016). Chemical composition, particularly milk fat level is used as quality test. Protein and Milk fat are most important components of different varieties of most shelf stable milk products. It is therefore very significant to decide the major chemical compositions of milk by supplementing high quality feeds (Haile, 2015). Depending on the milk production performance level, the same amount of dry matter intake may not result in the same milk quality and yield. Milk production performance relates to the nutritional content of dairy cattle feed, particularly protein quality (Sus-

anti and Marhaeniyanto, 2007; Martono *et al.,* 2016). Cotton seed cakes supplemented milk fat and protein yields were much greater than other treatments without a concentrate supplement and cows fed clover and Sorghum Stover (Morrison and Pattersonhe, 2007; Broderick and Sterrenburg, 1996; Anila and Muhammad, 2009; Matovu, 2016). All milk production characteristics were affected by genotype; high value cows had the highest milk output, fat, nutrients and carbohydrate concentrations, whereas low value cows had the lowest milk fat, nutrients, and lactose concentrations (Kennedy *et al.,* 2003; Xue *et al.,* 2011).

Concentrate Feeding

In Jersey breed feeding of concentrates did effect in maximize production of milk, butterfat and protein per lactation and a higher condition score. The butterfat and protein percentage of milk was not affected by the feeding of concentrates over two lactations (Meeske *et al.,* 2006). Concentrates high in energy are feedstuffs such as grain, brans from different cereals, maize and middling's while Concentrates rich in protein include noug seed cake, cotton seed cake, brewers and Grains (Wayu *et al.,* 2021). How much protein and energy a concentrate mixture should contain will depend on the quality of the supplement roughage and the level of production (Negash, 2018). As a rule of thumb, 1 kg good concentrate will improve milk production by 1.5 kilogram (Yator, 2018).

Open forage feeding

According to Kalac, (2010) found that milk from cows grazed or fed fresh forage, particularly from species-rich grasslands or forage legumes, has a higher ratio of unsaturated to saturated fatty acids (FA) and a high amount of nutritionally valuable trans-fatty acids than milk from cows fed silage or hay. A grazing-based low-input feeding approach boosts the proportion of beneficial FAs (Frelich *et al.,* 2009; Davis *et al.,* 2020). Additionally, Multi-nutrient supplement that raises milk productions and sustains the persistence of productions extended. The high quantity of crude fibers resulted in feed decrees, however when dairy cows were fed forage feeds containing up to 17 percent in terms dry matter, milk quality and output improved (Suharyono *et al.,* 2018).

Supplementing Concentrate and roughage ratio

Diet can alter the fat and milk protein content of milk. Generally, less roughage and high energy feeds will encourage higher fat content with a little increase in protein content to provide a higher protein to fat ratio (Schroeder, 2012). Milk SCC is found to be higher than those observed under low concentrate feeding. Some amino acid content may be low while others may high under prolonged feeding of concentrate. Similarly, other scholars reported that the highest concentrated diet might have an important impudence on mammary health (Xie *et al.,* 2017). It is recommended to feed animals at a 40:60 concentrate to roughage ratio in order to improve the level of milk composition percentage and yield (Salamon, 2006). furthermore, the Supplementation of feed increased milk fat content contents this means fatty acids in the diet can be transferred directly into milk fat formation regulates milk yields & quality (Pramono *et al.,* 2017).

Table 1: Different feed supplementation on the milking cattle to milk productivity.

Supplements feeding	Feed supplementations effect on milk productivity and quality	Authors
Concentrate feeding	Increased production of milk, butterfat and protein per lactation and a higher condition score.	Negash, 2018
Open forage feeding or Roughage	Milk from cows fed on silage or hay has a higher proportion of unsaturated to Saturated fats and oils & a higher amount of nutritionally advantageous trans-fatty acids.	Davis *et al.,* 2020
Concentrate: roughage ratio	recommended feeding to animals at 40:60 rations which improve the amount of milk productions percentage and quality	Salomon, 2006
Additives	Buffer supplementary to the diet help reduce the acid load placed on the rumen since great amount of grain are fed.	Michael *et al.,* 2001

Additives

Nutritional supplementation slightly but significantly increased the contents of casein protein, lactose, and fat while frequent milking increased carbohydrate (lactose) and fat but not protein (Fardet and Rock, 2018; Sorensen *et al.,* 2008). When high volumes of

grain are fed, buffers added to the diet help lower the acid load produced on the rumen. The principal buffers indicated are sodium bicarbonate, magnesium oxide, or a mixture of both (Michael *et al.,* 2001). A short summary of Feed Supplementation on dairy cattle productions and Milk Quality in above **Table 1**.

CONCLUSION AND RECOMMENDATIONS:

The changes of dietary constituents of animals are therefore directed at enhancing milk productivity of a specific with increased availability and higher nutrient use efficiency of energy, protein, and other essential nutrients. To maximize milking cow, appropriate supplementations might have the stability of concentrates diet, protein, micro, and macro mineral and different vitamins in quantity and quality. Supplements are grouped through their capacity to bring more energy, protein, fiber, or nutrients and minerals to the dairy cow. They originated in the arrangement of concentrates, conserved fodder, fodder crops, and by-products. Conserved forages are generally high in fiber. The summary of this review indicated that complementary feeding of milking cows significantly effect to raise milk productivity because dry matter has high nutritional value. Additionally, milk production effectiveness is based on nutrient absorption as dry matter intake, which maximizes milk yield and productivity by meeting the cow's nutrient requirements. This is the purpose of a feeding package. Furthermore, Improvements in genetic makeup only account for about thirty percent of total production, with the other seventy percent dependent on diet and management. Silage supplementation with grazing cows may improve milk production, protein output, and milk fat percentage. As recommended, Even though indigenous milking cows are low milk production since the scarcity of diet and unavailability of feed, if producers use appropriate supplementation of different feeds & improve the nutritional values of feedstuffs the production, and quality of milk cows should increase as well.

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CONFLICTS OF INTEREST:

The authors declare that there is no conflict of interest regarding the publication of this article.

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