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REVIEW ON: ASSESSMENT OF CONVENTIONAL ANIMAL FEED SUPPLY IN AND AROUND NORTH GONDAR ZONE, ETHIOPIA

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ABSTRACT: Assessment was partially done as per the syllabus prepared by Sustainable Resources Management Program of North Gondar Zone (SRMP-NG) financed by Austrian Government. The assessment was conducted in six randomly selected districts of North Gondar zone in the year 2015. The objectives of the study were; to assess and estimate the existing agro-industrial by-product feed for cattle and feedlot operators, to depict the feed stocks available for ration formulation and to measure industrial by-products of oil seed cakes and powdery mill (brans) in the study area. The assessment result was showed that, Gondar town was found to be the highest potential for agro-industrial by-product feed accounts about 560106 and 493436 quintal. The reason might be due to the availability of large number of feed processing factories in the town but bran could not found any other districts other than Gondar town. Grain milling factories produces bran were found in Gondar town and supplies feed to different function of animals. The other produced very minimal due to factory owners are argumentative on the current tax set by the government which, is beyond the production capacities of the factories.

Keywords: Conventional feed, Food Processing Plant, Oil Seed Cakes, Barn, Ethiopia.

REVIEW

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INTRODUCTION

An adequate supply of livestock feed is crucial important to the livelihoods of millions of people across the developing world and not just for smallholders, but also for pastoralists and the large number of landless who depend mainly on common land for grazing and browsing animals (Nansen, 1990). Intercropping of forage legumes with cereals offers a potential for increasing forage biomass yield and consequently, livestock production in sub-Saharan Africa. But in such a system the yield depression of the cereal grain should be minimal, possibly not more than 15%, for it to be acceptable by the farmer (Jaetzold and Schmidt, 2006).

The time of sowing of cereal and legume intercropping is critical for the yield of each crop and data so far available indicate that under sowing within 10 days of planting a fast-growing cereal such as barely does not depress cereal grain yield significantly, but with slow-growing, long-season crops such as photosensitive sorghum, grain yield is greatly depressed. In the case of sorghum, high grain yield is obtained if the legume is sown three to four weeks after the cereal (Kabirizi, et al., 2004).

Intercropping of forage legumes and cereals generally results in higher fodder crude protein yield (CPY) than cereal alone. However, fairly high yields of legumes are needed to augment the cereal residues in order to produce a feed composition capable of meeting the basal nutritional requirements of ruminant animals. The effects of intercropping on soil fertility vary with management practice and it is estimated that legume roots contribute between 5 and 15 kg N/ha to soil N under intercropping system (Lanyasunya et al., 2006).

Livestock production in the tropics and sub-tropics with the absence of supplementary feed to the different condition of animal is ridiculous Malede, 2012). Livestock production can be increased through increasing the

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productivity per animal and per unit area of land (Malede, 2012). A major factor in increasing livestock productivity will be the improvement of animal nutrition and feed supplies, especially in the case of ruminant livestock's and absence of agro-industrial by-product use in the study area is paramount important. Improved livestock diseases and parasite control, breeding and management will also be important, but initially, a major emphasis must be placed on providing better nutrition for ruminant livestock production (Whitman et al., 1990).

The natural grazing land in the study area consists of largely wide range of grasses, legumes and other herbaceous plant species (David, 2006). The existing feed stuffs in Ethiopia particularly in the study area of North Gondar zone is poor in quality and quantity which, provides insufficient protein, energy, vitamins, and minerals (Smith, 2002). Therefore, the importance of dealing the agro-industrial by-product feeds used as livestock feeds are a common practice for long period of the year in the study area (Sarkunas et al., 2004). Large quantity of agro-industrial by-products was produced in each year by different types of food processing plants in the study area (Methu, 1998). With the ever growing human population pressure, problems of land re-allocation in each district make competition between grazing land and crop land. In reality developing countries like Ethiopia which attempts to adopt to the use of those products are the better management and utilization of agricultural resources in the area (ARC, 1984).

The agro-industrial by-products produced in the entire district were sold to the people who are involved in the different livestock farm activities like private dairy producers, cattle fatteners, small scale individual dairy owners and farmers were used as maintenance and mach of which were used for production purpose in the study area (Lukuyu et al., 2009). Therefore, to achieve and full fill the aforementioned goals, the assessment was focused on the following specific objectives. To assess and estimate the existing agro-industrial by-product feed resources and formulating standardized ration for the different condition of animals in the study area.

Even though there is no reliable information about number of livestock censes in national as well as regional level and the current figures are estimated based on a various documents which was organized by different sectors. So far no formal censes has been done either by the central statistic authority or any other concerned organization in the country and hence the figure presented here is apparent.

MATERIALS AND METHODS

The number of each animal shown in table one above in the form of tropical livestock unite (TLU) which could be converted by using conventional conversion factors obtained by different literatures. High number of cattle (TLU) was found in all the districts which is about 4557 shown in (Table 1) this may be due to the contribution of cattle may be very high as compared to other animal found in the area.

Livestock populations in the assessment districts estimated in the above were well mentioned in each locality which posse's cattle is the highest and sheep and goat are followed second and third in each district respectively this is due to their multi-purpose function of the animal for different societies of the area. Moreover, equines (donkey, horse and mule) also found in all district and Gondar town correspondingly. Even though, camel is the most important animal in the tropical and sub-tropical area of the country, only few numbers of camels were found in Chillga district which has a total number of 125, these is due to the climatic condition and the adaptability of camels are very limited in other districts. The economic importance of camels especially in the desert and semi-desert area of the country has a tremendous contribution like, transportation of peoples and different goods from the farm community to the market centers in the area but the environment is not conducive for survival in the central and central highlands of the Ethiopia that makes limited in their availability. Camel has a strong resistance for overcoming in shortage of water, feed and hot temperature and has the ability to give reasonable products in the fragile environment of the country.

RESULTS AND DISCUSSION

Oil Seeds by products

These products are perhaps, the most important groups agro-industrial by-product feed for livestock feeding. Oil seed cakes are rich in its protein contents in most cases natural grasses, herbages and other agricultural by-products deficient in nutrients which need for supplementary feeds for all types of animal to increases the overall productivity of livestock but also to make more efficient use of protein deficient feed resources (Calo, 1997). The farming communities are well experienced for purchasing of oil seed by-products to their animals particularly during the dry period in all study districts.

In the study area we have assessed three types of Agro-industrial by-products which are used as livestock feeds involving by different activities in the area. One of the most important energy sources feed types are

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produced from various grain milling by-products which are commonly called bran's, and has a total production potential of 493436 quintals of various type of bran.

Livestock production and productivity in the area has become increasing and the income generated from livestock and livestock products in terms of price either live animal or their products show a tremendous changes and the living standards of the farmer's found in the study area which agro-industrial by-products for their animal has become improving (Smith et al., 1990). The remaining feed types produced from various types of oil producing factories which are mostly an assortment of oil seed cakes used as source of protein supplement feeds for feeding of ruminant livestock produced) quintals.

The total annual production potential of the of the various oil seed squeezing by different factories was (1511286) quintals in (Tables 3 and 4) of cakes produced in the study area. These are immense contributors to supply for animal feed and improve the existing protein deficiency present in most of the grazing grasses and herbages used by livestock feeds (Owen and Aboud, 1998).

As we observe from the above (Table 6) the highest by-product produced among the six districts is Gander zuria, which is the potentially high production as a total of 26,134 quintals in different types of oil seed cakes in the year 2000 E.C. On the other hand the livestock population indicates very minimal which showed the second from the last which has the total livestock population of 23784 and this showed that there may be a positive relationship between the feed resources availability with existing livestock population. Wogera District has a huge livestock population which indicated (151,837.5) and has feed production potential of Agro-industrial by-products has become very less showing that (7300 quintals only oil seed cakes) in the year 2000 E.C and this indicates, there is some gaps between feed resource availability with the present livestock population in the area.

In addition to this Dembia district is next to Gondar zuria in potential of Agro-industrial feed production potential (18,250 quintals) this showed that, there is stability between feed resources availability with the present livestock population as compared to Wogera District. Gondar town is the most leading Agro-industrial by-product production potentials which has 274,288 quintals of diverse feed resources were produced in the same year. The total livestock population was estimated 77,570 as showed above well mentioned there is optimal feed resources availability with the present livestock population in the area. The main limitation to increased use and production of agro-industrial by-products in rural areas is the fact that these materials are usually produced in urban or pre-urban areas where most of the agro-industrial processing plants or industries are located. Therefore, if these by-products are to be utilized by smallholder farmers, they have to be transported to rural areas. As result this makes them often quite expensive. These products are also highly demanded by the commercial farmers who have advantage over small-scale farmers in terms of purchasing power and availability of own transport to their farms (Sarkunas, 2004).

Economic analysis of the feed assessment

The economic analysis of the smallholder cattle feeding program involves the examination of the overall profitability of the livestock products and prices of live animals, the determinants of the profitability and possible measures for improving the economic performances of the participating farmers found in the study area of the North Gondar Zone. In order to determine the relative contribution of weight gains and price changes to the gross margin was highly determined (Kabirizi et al., 2004).

Challenges and constraints of conventional feeds

The first problems in the production of Agro-industrial by-products is most of the factories which produces various by-products were established round or / and in the town that makes difficult to transport from their place of origin to farmer places and increase transportation cost. The second most constraints was found the by-products specially brewery grains contains high amount moisture that makes difficult to transport from the processing plant to the farming community and individual small holder found nearby district of the area. Third unsuitable issues, if the feed not dried the high moisture contents causes difficult in storage, transportation and handling which limit the regular use of these materials as livestock feed (Kabirizi, 2004).

The other simple but not neglected obstacles to use the Agro-industrial by-products as livestock feed was some of the oil seed cakes was used as fuel for cooking enjera and other foods. The four most constraints the different Agro-industrial by-products has not yet well identified their nutritional values in terms of crude protein, energy, mineral, vitamins and even their fiber contents and nonedible parts in the study area. The other most problems was found to be consider the production potential of each individual factories were very low due to their week competition between the local oil with the imported palm oils and high taxation rate put by the Ethiopian government (Sanford and Ashly, 2008).

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Table 1 - Livestock Population in North Gondar zone (TLU)

Name of district	Cattle	Sheep	Goat	Donkey	Horse	Mules	Camel
Gondar town	192.7	125	108	-	10.4	-	-
Gondar zuria	61.13	10.3	35.9	4.2	10.3	7.58	-
lay armachiho	1036	11.5	15.4	37.95	35.9	0	-
Dembia	1195	61.9	21.1	39.4	23.6	0	-
Wogera	593	220	24.5	27.9	-	15.6	-
Chilga	1479	2.52	0.63	34.192	3.58	0	0.5
Total	4557	431	205	143.64	83.6	23.2	0.5

CSA (2006, - = shows no data.

Table 2 - Grain milling factories and animal feed supply in Gondar town

Name of processing Plant	Yield (qt)	Types of by-Products	Year of establish
Sewlesew beltina wutet grain mill	248972	Bean and pea Bran check pea bran	1998
Tewoderos grain milling factory	98689	Bean & peas barns	1985
Oil milling factory	75896	Noug, SF, GN cakes	1987
Abine grain mill factory	69879	Beans bran	1982
Total feed supply	493436	--	--

Sources: Survey data analysis

Table 3 - Oil extracting factories and by-products in Gondar town

Name of factory (Local name)	Quantity of By-product	Types of by-product	Factory establishment year
Bereka	81016	Noug & GNC	1975
Kibe oil factory	59240	Noug,SF, GNC	1987
Fasil oil factory	28776	Noug and GNC	1985
Mina oil factory	85857	Noug & GNC	1987
Dashen oil factory	62584	Noug,SF, GNC	1985
Kamil oil factory	58136	Noug,SF, GNC	1985
Cotton seed factory	85741	Cotton SC	1990
Abdirkadir & his family edible oil factory	98756	Noug,SF, GNC	1988
Grand Total		560106 quintals	

Sources: ILDP (2002). Key: - GNC= Ground nut cakes, SF= Sun flower, SC= Seed Cakes.

Table 4 - Oil extracting plants and production potential in each district

Name of the districts	Quantity of by-product (Quintal)	Types of by-product produced
G/zuria	26191	NC, SFC and GNC
Dembia	71549	N & GNC
wogera	114818	NC & GNC
L/armachiho	104720	NC, SF and GNC
Gondar town	560106	NC & GNC
Chilga	36918	NC, SF and GNC
Grand Total	914302	

Sources: ILDP (2002). Key: - NGC= Ground nut cakes, SFC= Sun flower cakes, NC= nug cake * = no data.

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CONCLUSION

Suggestion and recommendations in future priorities

The Government as well as any private investors and non-governmental organization should assist the factories by-products to arrive to the smallholder income owning farmers and sold their by-products with a reasonable price through subsidizing the cost so as the those farmers would get a good income and could improve their way of life. The brewery grain should dried the by-products to the standard of livestock feeding practice, so that the feed would have a specific feed ingredients and could clearly give the feed quality information to their customary. The Government should establish farmers' cooperative the way that those farmers and individual small holder would contribute their animal products to the cooperatives according to their quantitative products hence each individual contributor would get a better income by changing the products in different forms of salable products and sold with a better price to their customers. The Government should design and make access to use any alternative electric power to cook their food rather than using any wood materials and various oil seed cakes in the area.

Any factory owners or private livestock investors and other academicians should make analysis on the bases of nutritional values of the different Agro-industrial by-products as they could make a sort of promotion about the quality of their products and would get a better price and income. Each individual factory owners and Government increase the production potential of the by-products through by decreasing and reduced the tax and eradicate value adding tax (VAT) from the food processing industries and reduced importing of palm oils the country respectively. Therefore, the individual factory processor would increase the production potential of the factory.

DECLARATIONS

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Authors' contribution

I contribute on data analysis and the write up of the manuscript and the second authors was participated on data collection and gathering information for this paper.

Conflict of interests

The authors have not declared any conflict of interests.

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