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Dairy sector in Yemen: A driving force for food security

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Abstract

Agriculture is a one of the main sector of the national economy of Yemen contributing about 17 percent of total Gross Domestic Production (GDP). Livestock contributes about 20 percent to agricultural GDP. In Yemen, milk production is one of the important animal based protein source for the local population. Milk is produced from camels, cows, goats and sheep. The ruminant population estimated over 21.2 million heads. The Sheep population represented the largest share of this population with 9.7 million head accounting for 45.49%, while camels with 460 thousand animals accounted for 2.16%. In 2014, milk production estimated at 391 thousand tones accounted for 1.3% of the Western Asian production. Milk production in cattle, goats, sheep and camels represented 60.13%, 19.20%, 16.97% and 3.71% of the Yemen milk production, respectively. This article highlights Yemen livestock production system, managerial strategies of milk sector and food security of produced milk and products. Specifically, it will be question to analysis the opportunities, weaknesses, and proposes some new approaches of solutions to improve the competitiveness of this sector while compare to the developed countries.

Keywords: Animal production, milk, food security, opportunities, weakness

Introduction

The Republic of Yemen is at the south western corner of the Arabian Peninsula, between 12° and 17.7° North and 43.5° to 52° east. Yemen is bordered to the south by Saudi Arabia, to the north by the Arabian Sea, to the west by the Red Sea, and to the east by Oman (see Figure 1). The weather is sub-tropical, moderate to cold in central, hot humid in western plains and lowland deserts and mountains and hot and dry in eastern desert. food security and agriculture sector are closely related in Yemen, livestock production critical source for provide protein of animal, Gross Domestic Product (2012) reported that the agriculture sector produce about 12.6 percent, and is the essential source of income for 73 percent, over that Central Statistical Organization (CSO) (1999) [5] indicated that agricultural activities in Yemen are the prime occupation of about half of the population of the work force of 3,100,000, 58 percent are involved in agriculture Overall food self-sufficiency is about 60 percent. Yemen's agricultural sector expanded rapidly at the end of the last century, and markets and marketing policies flourished, driven by investment. Livestock was estimated to contribute approximately 12% to the national agricultural production and 3% of the total national GDP (CSO, 2001) [4]. However, livestock farms, either specialized or mixed with crops, represent about 80% of total farms in the agricultural sector Ward, (1999) [12]. Self-sufficiency in grain decreased to only 40% in the late eighties of the last century Livestock Development Project, (1993) [12]. Urban population has increased due to the immigration from the rural areas to the cities which had a negative impact on economic development especially in the agricultural sector. The annual growth rate of 2.2% in the agricultural sector at the beginning of the nineties of the last generation did not cope with the annual population growth of 3.5% in the same period Beleidy, (1996) [3]. This article highlights Yemen livestock production system, managerial strategies of milk sector and food security of produced milk and products.

Materials and Methods

The present study references previously reports and studies which have been carried out at this area. Recording of statistics from different references such as division of Food and Agriculture Organization (FAOSTAT) and Yemen Ministry of Agriculture and Irrigation (MAI) as well as calculated average by using the following equation:

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% Species = $\left[\frac{X_s}{X_t} \right] \times 100$ (this is for figure 1).

Where

X_s: is species of animal,

X_T: is the total for species of animal;

Average milk production = X₁-X₀ = amount

X₁: is the milk production for second year

X₀: is milk production for first year

Results and discussion

Food security defined that is having adequate availability access, stability and utilization in food exporter that provide the necessary nutrients to lead healthy life. Food security is the physical supply of food available for one to consume FAO, (2015) [8]. With advancing science of nutrition, the concept of food security is insufficient consumption of nutrients to meet biological requirements Habicht *et al.* (2004) [1]. The Department of Agriculture asserts that the dairy and beef industries are at the forefront of the agri-food economic growth and claim to be taking the reins to ensure global food security by increasing supply to meet the pressing global demand for food DAFM, (2015) [6]. Geographical distribution of livestock genetic resources and production system in Yemen are mainly cattle, sheep, goats and camels (Table1). Livestock distribution according to regions in Yemen Hasnain *et al.*, (1989) [10]. Stated Wardeh, (1989) [14] that a female animal per year gives 5,000kg of milk and gives 6 to 7 young during her life with good feed if they get adequate feed, the daily gain of the new born reach to 0.8-1.5kg. Livestock is contribute to poverty alleviation by providing of food. There are, 604,382.5 TAU in the Coastal and 1,009,040.5 TAU in the desert region and 1,422,409.4 Tropical Animal Units (TAU) in the highland (Agricultural Statistics Year Book, MAI 2000a). In many parts of Yemen Pasture-fed livestock has been traditionally practiced and is a prominent feature of rural economy and agricultural activities (MAI, 2000b). a great number of livestock is using Natural pasture that fully or partially depend on it for their sustenance. But the existing pasture can only provide an average of 40 percent of the nutritional requirement for the 9,380,000 and 9,688,000 sheep and goats respectively (Alsaghir 2001; FAOSTAT, 2017) [2, 7]. Natural grazing covering 80 percent of annual livestock feed requirements. Cattle in most places are housed and stall-fed all the year, but in high rainfall areas they are herded in summer. Cattle are additionally fed on crop residues and grasses. Milking cows receive some supplements of household wastes, some cereal and meals. It is obvious that the quality and the quantity of the available feed limit the productivity of cattle, sheep and to lesser extent goats. In Yemen is farm animals are kept for meat, milk, sour milk (Laban), butter (ghee) and draught power, together with wool, skin and manure. The livestock population has witnessed an overall increase between 2004 and 2014 as indicated in Table 1 below. The differences between Ministry of Agriculture and Irrigation and FAOSTAT data need to be followed up and resolved. In 2014, sheep (9.69 million) and goat (9.38 million) represent approximately 45.49 and 44.05 percent of milk producing animal population. While cattle estimated less

1.8 million and camels 0.5 million accounted for only 8.30 and 2.16 percent of this population.

The total of population estimated at 21.3 million represented 13.6 percent for Western Asian ruminants' population. Turkey has the largest population with over 55 million heads of milk producer animals including buffalo, camel, cattle and small ruminants. While Bahrain flock with nearly 0.07 million represents lowest population accounting for less than 0.01 percent. Table 1 shows that amount milk produced in Yemen during last 10 years has significantly varied between years and differ between species. For example the milk production in camel gradually grew with a yearly average 217 litre. Similar trends were observed for milk production in cow in first 5 years average 18619.75 litres annual. In 2008 milk production decreased by amount-174831 litres and finally increased again, in last 5 years average of 7994 litres. The reason of this decreasing level of production might be due to lack of modern techniques for the management of animal genetic resources, inadequate management of grazing land, poor marketing channels, networks lack of training and qualified manpower to develop animal genetic resources. Production of Yemen estimated in million tonne (MT) was nearly 0.39 litres account 1.3% of the western Asian production in 2014 (Table 2). Among Western Asia countries, Turkey 18.58 MT, Saudi Arabia 2.35 MT and Syrian Islamic Republic 2.30 MT are the biggest milk producers accounting for 61.52%, 7.81% and 7.63% respectively (FAOSTAT 2017). Figure 1, the results revealed that the amount of milk produced from cows largely contributed with 60% to the national milk production as for goats sheep and camel their production accounted for 19%, 17% and 4% respectively. FAOSTAT (2017) reported that in Asia the value cheese production (2000-2010) was 103 MT and higher than European production approximately estimated at 8.8-10.2 million tonnes during the same period. The value butter and ghee production (2000-2010) was 3-4.9 million tonnes compared with other continents which lowest value have continent of Africa (0.1-0.9) during 2000-2010 (FAOSTAT, 2017) [7]. That are reasons reflecting consumption habits as well as low incomes and poverty, but the gap is gradually closing, especially in Eastern and Southern Asia. For example, in Eastern Asia, per capita dairy intake has more than doubled in the past decade, therefore increasing the consumption of soy bean as feed replaces the feed grain as feed. A principal systems in developing countries with lower average grain-meat ratios (FAOSTAT, 2107) [7]. Reported agricultural statistics yearbook (2009), that the livestock production in Yemen was 30.334, 39.425, 144.680, 2.169 MT for milk of sheep, Goat, cow and milk of camel in the 2005 respectively compared to 42.122, 52.278, 194.016, 2.671 MT for milk of sheep, goat, cow and milk of camel in 2009 as mentioned that feed for livestock production is significant limitation to growth in the sector during 2005-2009 that's because the feeding concentrate during that's time it was just as beginning in Yemen and products often lack animal protein, and other key ingredients, leaving local production deficient. Also Breeding stock is also significant problem for cattle, sheep and goats, as the there has been in sufficient investment to improve the stock over the year.



Fig 1: Map of the Republic of Yemen (<http://www.robinsonlibrary.com>)

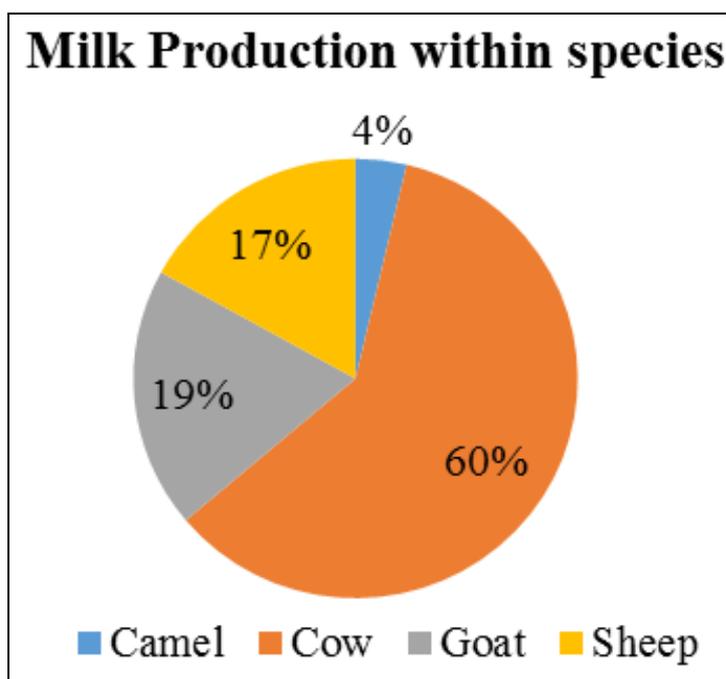


Fig 2: Comparison of milk Production within species (Source: FAOSTAT, 2017) ^[7]

Table 1: Milk producing animals' number (million heads) and milk production (million tonne) (2005-2017) in Yemen

Years	Animals number (million heads)				Milk production (million tonnes)
	Camels	Cattles	Goats	Sheep	
2005	0.36	1.45	7.86	7.98	0.29
2006	0.36	1.46	8.04	8.20	0.31
2007	0.37	1.50	8.41	8.59	0.34
2008	0.37	1.53	8.71	8.89	0.37
2009	0.38	1.57	8.88	9.09	0.40
2010	0.40	1.61	9.02	9.21	0.32
2011	0.44	1.65	9.11	9.36	0.33
2012	0.44	1.68	9.16	9.42	0.35
2013	0.45	1.72	9.26	9.55	0.37
2014	0.46	1.77	9.38	9.69	0.39
% species	2.16	8.30	44.05	45.49	-

Source: FAOSTAT, 2017 ^[7]

Table 2: Milk production (million tonne) in Western Asian countries

Country	Quantity	%	Country	Quantity	%	Country	Quantity	%
Turkey	18.58	61.52	Georgia	0.66	2.17	Oman	0.19	0.64
Saudi Arabia	2.36	7.81	Lebanon	0.39	1.30	United Arab Emirates	0.15	0.51
Syrian Arab Republic	2.30	7.63	Yemen	0.39	1.30	Occupied Palestinian Territory	0.12	0.39
Azerbaijan	1.86	6.15	Jordan	0.32	1.07	Kuwait	0.06	0.21
Israel	1.57	5.21	Iraq	0.29	0.97	Qatar	0.02	0.08
Armenia	0.70	2.32	Cyprus	0.21	0.69	Bahrain	0.008	0.03

Source: FAOSTAT, (2017)^[7]. Figure 1,

Conclusion

Livestock production is serious sector to growing up economic and stability a social of Yemen, this study evidence that the last decades until 70th Yemen was depended nutrition (self-security), many of challenges and obstacles which facing livestock production in Yemen. Yemen still has opportunities to recovering this sector to lead to achieved food security again.

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