NATIONAL GOAT RESEARCH STRATEGY IN ETHIOPIA

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Introduction

Ethiopia contains about 15% of the sheep and goat population of the African continent. With approximately 16.7 million goats, Ethiopia ranks high both in Africa and in the world (FAO, 1994). The indigenous goat breeds/types are widely distributed and are found in all administrative regions of the country and undoubtedly evolved through a process of natural selection that favored adaptation and survival rather than production. Goats in the lowland are kept both for milk and meat production, whereas in the highlands they are mainly kept for meat. Goat production in the lowlands relies on browsing and grazing whereas in the highlands communal grazing, fallow lands, and crop residues are the major feed resources. Usually goats receive little to no supplementary feeding and minimum health interventions.

Although there exists a prejudice against the consumption of goat milk and meat they tend to replace sheep as the dominant small ruminant species in northern, eastern and western highlands. On the other hand, in the semi-arid mixed farming systems and in the arid pastoral lowlands, goat milk and meat are highly valued commodities. Milk production from goats is particularly important to poor smallholder farmers in the highland and semi-arid mixed farming systems. These farmers have neither the financial nor physical resources to maintain large ruminants (Zelealem and Fletcher, 1993).

Goats are also a source of other valuable non-food products such as skins used as raw materials for various traditional household products manufactured in local cottage industries. In the country it is estimated that 14.6 million skins are produced annually, of which 90% of sheep and 70% of goat skins are recovered from the market (Zewdu Kebede, 1995). The Bati genuine skin is known for its quality and fetches premium prices on the world market. Goats are extensively milked and most milk is marketed and processed into curd and butter. In the lowlands (arid and semi-arid areas) where crop production is not reliable, goat production has experienced success, with high commodity prices.

Highlights of Goat Research

The former Institute of Agricultural Research (IAR) has been the main national institution for sheep and goat research. A research program in small ruminants was established in the mid-1970's. However, during the past three decades goat research has always been a secondary component of the small ruminant research program in IAR. The goat research program, which includes management studies associated with breed evaluation and improvement programs, was started at Holetta and Melka Werer research centers (EARO, 2000).

Except for the limited data on the productivity of Adal goats and highland goats generated from the discontinued goat research programs at Werer and Holetta research centers, performance of other local goats has not been documented even though Ethiopia has a large resource of goat

breeds/types. Programs at Holetta had the disadvantage of being in the cool highland environment where goats are not an important livestock species. Work at Melka Werer was in a rangeland environment where goats are favored, but the absence of unimproved rangeland on-station, and the difficulties of "on-farm" investigations with nomadic pastoralists, limited the potential applications of research results under the surrounding pastoral system.

The initial program at Werer evaluated the productivity of indigenous Adal goats and generated data for estimating genetic parameters for the breed. The Adal goat is a slow maturing breed with relatively low productivity. Females attain mature body weight of 33 kg at 3 to 4 years of age. Maximum milk production is about 25 kg from a 12-week lactation period, and the breed exhibits a maximum twinning rate of 40% until their third kidding. Reproductive rates were depressed when they were mated at less than 12-month intervals.

A crossbreeding program with the Saanen breed showed that the half-bred was not adaptable to the environment and could not survive even under on-station management. However, the quarter-bred Saanen produced 30% more milk than the purebred Adal (31 and 24 kg, respectively, in a 12-week lactation) without any reduction in other aspects of productivity and without a need for improved management inputs or increased feed resources for flock maintenance. Post-weaning growth rates of both purebred Adal and quarter-bred Saanen kids were only about 50 g/day, and they did not respond well to supplementary feeding. Castration did not affect male growth rate, but increased their market value.

Similarly, a comparison made between Somali and Anglo-Nubian goats managed uniformly at Alemaya University showed that milk production for the first 6 weeks of lactation (41 kg or 0.97 kg/day vs 125.3 kg or 2.98 kg/day) and litter size were higher for Anglo-Nubian. Highland goats seem to produce more kids per kidding than the Adal due to a higher twinning rate of about 50%. Average milk production by the indigenous highland goats from a 12-week lactation was only 19 kg. This was increased to 52 kg in half-bred Saanen does, with a slight reduction in reproductive rates and a marginal increase in the growth potential of crossbreds. This indicated that higher levels of Saanen crossbred had poorer reproductive rates, and did not show any further increase in milk production.

Goats are commonly slaughtered at around yearling age when their body weights are 15 to 20 kg. Because of their relatively low growth potential, increased meat production from the indigenous breeds so far evaluated is expected to come from increased numbers of animals rather than from increased growth rates (Zinash Seleshi, 1999). Although milk production and body weight gain from goats is moderately heritable, it would take many generations to achieve a large increment through genetic selection from the present low production levels of indigenous breeds. Therefore, quicker progress in obtaining higher milk production and pre- and post-weaning gains from the indigenous breeds/types could be attained through crossbreeding with appropriate exotic genotypes.

Survival in both lambs and kids is commonly less than 80%. In general, about half of the pre-weaning deaths on-station and under traditional management occur during the neonatal period of seven days postpartum. Mortality rates in adult sheep and goats are also commonly greater than 15% per annum and this means that most young females must be retained for breeding.

Current Status of Research on Goat Production

Goat research has been largely neglected in the country. Research programs on highland goats at Holetta and the Adal goat at Werer were discontinued after a short period. A full-fledged goat research program representing the semi-arid mixed farming systems has been carried on at the Adami Tulu research center since 1992.

In addition there is a single NGO-sponsored (FARM-Africa) dairy goat research and development project, associated with the Ministry of Agriculture (MOA), Alemaya University and Awassa College. The Awassa College of Agriculture at present maintains a dairy goat improvement program initiated by Farm-Africa in breed improvement and management studies on the indigenous Somali goat and its crosses with the exotic Anglo-Nubian goat breed. Goats have not been considered in the recent livestock breed improvement project proposal of the MOA.

A number of important distinct goat breeds/types making substantial contributions to the farming community in their respective regions have been identified. Of the suggested goat breeds/types, only the Somali goat is currently being evaluated. Future goat research programs should be expanded to include subprograms in the highlands of eastern, western and northern Ethiopia and in the lowlands where goats are extensively milked for household consumption and sale and goats are also valued for meat production. In general, the research activities carried out so far in IAR and higher learning institutions could not bring significant improvement in goat production due to the fact that the programs lack coordination and an appropriate technology dissemination system.

To overcome the research problems of the past, a number of research activities have been proposed and are being executed. The numbers of stakeholders conducting research have increased and the programs are more or less exhaustive as compared with previous efforts to address farmer problems.

Future Research Direction

1. Program and infrastructure development

1.1 The program at Adami Tulu should be expanded to cover research requirements of the semi-arid areas.

1.2 However, Adami Tulu alone will not be able to satisfy the requirements of goat research for semi-arid areas of the country. Therefore, research centers that are under construction should be considered as additional goat research centers, since goats are an important component of smallholder farmers of the area.

1.3 The goat research at Alemaya and Awassa should be further strengthened to address all the research gaps in their respective administrative regions.

1.4 The discontinued goat research program of Werer should be reinitiated and strengthened to deal with the improvement of Adal goats.

2. Research focus

1.1 Major goat production constraints should be identified.

1.2 Goat breeds that have not been studied should be identified, characterized and evaluated in their respective localities.

1.3 Genetic improvement studies are needed to further improve those breeds with high production potential or to correct for deficient traits such as low growth rate, poor milk production and the like.

1.4 Further assess the productivity, in terms of both quality and quantity, of crossbred animals under different management options.

1.5 The comparative quality and market preference of crossbred meat and milk production should be critically assessed.

1.6 Assessment of the drawbacks of goat milk processing methods and the quality of the skin of crossbreds.

1.7 Nutritional studies based on physiological stage and purpose.

1.8 Major diseases hampering productivity should be identified and control options formulated.

1.9 Evaluation of traditional veterinary practices for the treatment and control of health problems.

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Annex 1. Number and percentage distribution of goats by sex and region for private holdings, 1995/96 (1988 E.C.)

Region	Male		Female		Both sexes	
	Number	%	Number	%	Number	%
Tigray	417.73	4.19	875.91	8.79	1293.64	12.98
Afar	50.15	0.50	78.61	0.79	128.76	1.29
Amhara	1053056	10.57	2142.79	21.49	3196.36	32.06
Oromia	1196.83	12.01	2424.82	24.32	3621.65	36.33
Somalie	89.37	0.90	182.29	1.83	271.66	2.73
Benshangul–Gumuz	40.20	0.40	97.39	0.98	137.59	1.38
S.N.N.P.R.	355.65	3.57	839.31	8.42	1194.96	11.99
Gambela	**	**	**	**	**	**
Harari	4.51	0.05	10.66	0.11	15.16	0.15
Addis Ababa	1.88	0.02	3.14	0.03	5.02	0.05
Dire Dawa	30.80	0.31	63.23	0.63	94.03	0.94
Total	3243.71	32.54	6725.25	67.46	9968.97	100.00

** Estimates are not reported in this table because of high coefficient of variation. However, they are incorporated in the total estimates.

Source: CSA. 1996.

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