LIVESTOCK DEVELOPMENT NOTES NO. 15.

PRODUCTION AND MANAGEMENT SYSTEMS USED FOR GOATS IN SOME ISLAND COUNTRIES IN THE SOUTH PACIFIC REGION

EROAROME M. AREGHEORE. The University of South Pacific School of Agriculture. Alafua Campus, Private Mailbag, Apia, Samoa.

ABSTRACT

In the South Pacific region goats are not regarded as traditional animals. However, most countries have selected goat as an animal for consideration. Three systems of production are found; village system, semi-intensive system, and extensive system. The number of animals kept, the peoples' culture and taboo have influenced the production system used in the country. Several constraints attribute to the low goat population and production in the South Pacific region. Amongst these are; low demand for goat meat in most countries except Fiji and Papua New Guinea, the taboo that most island countries population do not like goat meat, that goat is considered as destructive animal therefore requires high fences to enclose them, high loses due to predators like dogs, environmental constraints, and technical, economic and social situation of goat keepers. Goats and other livestock can be integrated with cropping systems and due to their small size, goats could be more suitable than cattle.

KEYWORDS: *goats, production systems, constraints, prospects, South Pacific.*

INTRODUCTION

Goats have been domesticated by nomadic people in the middle east about 10,000 BC (Kettle, *et al.* 1983; Hussain 1988). In the South Pacific region, there is no authentic record of when goats were first introduced. They arrived with missionaries and European settlers in the early 19th century to satisfy their milk demand (ADAB 1979; Amoach 1985), and later by Indian settlers during 1877 - 1916, who introduced meat type goats (Hussan, *et al.* 1983; Hussan 1985). European settlers also introduced goats for fibre in parts of Taveune in Fiji and competed in Australian Agricultural shows and were awarded top prizes as early as 1862 (Hussain 1985).

Goat is an efficient animal and plays a significant role in protein production for humans. They are multipurpose animals producing milk, meat, skins and hair (Devendra 1978). In subsistence agriculture, goats are important due to their unique ability to adapt and maintain themselves in harsh environments. They perform particularly well in areas where the climate is hot and dry. The world goat population is concentrated in the tropical, subtropical areas in developing countries in Africa and Asia, and in warmer temperate regions around the Mediterranean and Central America (Wilkinson and Stark 1987).

The objective of this paper is to highlight the production, management systems used, and potential contributions of goats in Fiji, Solomon Islands, Tonga, Vunuatu, Papua New Guinea (PNG) and Samoa.

SOCIO-ECONOMIC RELEVANCE OF GOATS

In some South Pacific countries goats play an important role in the socio-economic life of people and make significant contributions to the national economy, although in most parts of the South Pacific region goats are not regarded as traditional animals. However, most countries have now selected goat as an animal for consideration (Simpson 1985).

Goats have a low unit value, small size, high reproductive rate, short generation interval, inquisitive feeding habits and high digestive efficiency for coarse forages, and the ability to adapt to variable management systems under different climatic conditions. The above attributes contribute to the acceptance of goat by smallholder

farmers in most developing countries of the world. As goats can survive, and even flourish in areas where cattle and sheep cannot because of their digestive efficiency (Aregheore 1996) and low investment input, it has been nicknamed as the "poor man's" cow (Aregheore and Lungu 1997).

At present most countries in the Pacific region import meat. This not only drains the limited foreign exchange reserves but also affect the fragile economy of these countries that depends mainly on foreign aid for development. Goat meat produced locally, apart from being a better quality protein substitute, compared to imported mutton flaps and others would conserve drainage of national foreign exchange reserves.

Countries considered here (Fiji, Solomon Islands, Tonga, Vunuatu, PNG and Samoa) are endowed with good natural and improved pastures, but these resources are not fully utilised at present. Goats can be conveniently raised with food and cash crops and therefore contribute to the diversification of livestock production in these six countries. Other minor socio-economic advantages are; additional income to farmers, job opportunity as well as psychological stability for certain members of the family particularly children, women and the elderly, and also meet the specific family or community social obligations (Aregheore 1994).

DISTRIBUTION AND POPULATION OF GOATS

Small ruminant production contributes substantially to the total productivity in the South Pacific. However, national statistics do not show the exact extent of this contribution and this in turn has contributed to the unreliability of data on goats in the South Pacific. Data on population and distribution of goats in the South Pacific are thus conflicting (Aregheore 1999). Data given by FAO and individual researchers in the region differ significantly.

Available data (Table 1) from different sources (Hussain 1955), MacFarlane 1995, FAO 1986, 1996) attest to the discrepancies in the population figures of goats in the South Pacific. Therefore, there is a need for accurate data on goat populations to enable researchers and policy makers work effectively fully for integration of goats into the farming system of the smallholder farmers.

Table 1. **Goat population in some South Pacific countries**

Country	Hussain 1985	FAO 1986	FAO 1986
Fiji	155,000	185,000	211,000
Tonga	14,000	15,000	15,000
New Calendonia	10,000	-	-
PNG*	3,000	16,000	16,000
Cook Islands	3,000	3,000	7,000
Vanuatu	3,000	11,300	11,300
FSM**	1,100	-	-
Solomon Is.	400	1,200	1,200
Samoa	200	-	-
Tuvalu	100	-	-
Kiribati	100	-	-
Repl. of Palau	80	-	-
Tokelau	16	-	-
Marshall Is.	4	-	-
Niue	-	-	-

* *PNG: Papua New Guinea*
** *FSM: Federated States of Micronesia*

GENERAL PRODUCTION SYSTEMS USED FOR GOATS

There are three systems used for goat rearing in the region (Amoah 1985).

(i) Village system

This system is practised mostly by the subsistence farmers as a part-time operation. About 1-5 heads are generally tethered in situations where crop cultivation is practised. Crop residues and kitchen waste are fed to them. In some situations they are kept close to residences or grazed on rotation near road sides on public land.

(ii) Semi-intensive system

Like the village system, it is also a part-time operation and animals are allowed to graze between 4-6 hours in a day. This grazing could be in the morning or evening under coconut or oil palm plantations. Stocking rate under this system may range from 16-40 goats per hectare and this depends on the type of herbage available. They may be fenced in paddocks as practised in Fiji and in Samoa. The goats under this system may be housed or given some forage or crop residues

as supplement. By-products like copra meal and brewers dried grains may be fed occasionally during critical periods. Number of goats may range from 10 on private farms to over 500 on government owned farms.

(iii) **Extensive system**

Under this system goats range freely and mostly unattended. Stocking rate ranges from 1-4 goats /hectare. Management is almost zero with very little inputs. Goats under this system also graze under coconut during the day and are confined at night. Extensive system is practised in Yasdawas Lomaiviti, Lau, in Fiji and, Ha apai and Vava'u group of Islands in Tonga.

With the exceptions of Fiji, Tonga and Samoa where goats are raised under the above system in government farms and research stations, animals are usually confined and grown as meat and milk producers in various countries.

PRODUCTION SYSTEMS USED IN DIFFERENT COUNTRIES

The goat seem to have outlived its rather misplaced bad reputation as an unwanted destroyer of the terrain, as humans become more aware of its importance as a cheap source of meat and other products, relative to other ruminants, when properly managed (Amoah 1985). Due to their rumen physiological adaptation goats can live on a wide range of locations and feed Aregheore 1996). Therefore, this adaptation has made goats survive in the South Pacific.

The peoples' culture and taboo and the number of animals kept have influence on the production system used in a country. Below is an account of production and management systems used for goats in Fiji, Solomon Islands, Tonga, Vanuatu and Samoa.

Fiji

There is no uniform single system of goat management practised in Fiji (Walken-Brown 1984). Vast majority of goats are kept as a subsidiary enterprise, and because of competing demands for time and other reasons, most farmers use very low or zero management systems. However, most goat farming systems fall into one of the following size categories, (Walken-Brown 1984).

Small scale goat raising is a side line to sugarcane and other cash crops. This systems is practised, effectively by Indian farmers. Most of the country's goat population is reared by subsistence and small scale farmers. The goats are kept mostly for personal use with occasional sales. They are usually tethered at roadsides (embankments) or on uncropped land by day, and shelterd and protected at night. However, goats in Yasawas Lomaivily, Lau in Fiji range freely unattended. Fijian cattle farmers at the Western Division, particularly in the Beef schemes such as Yalavou, Ului Saivou and Tilivalevu also raise goats. They graze goats extensively on native and semi-improved pastures under goat fencing with provision for shelter but with few other management inputs or supervision.

Goats raised by Fijian landowners on offshore islands particularly in the Yasawas range freely apart from occasional night yarding and slashing of *Leucaena leuocephala* for supplementing feeding. Large scale goat raising by coconut plantation owners in Vanua Levu, Taveuni and Laucala maintain clean plantations to facilitate nut collection.

Goats are also reared, mainly by Indian farmers, as a sideline to dairy farming in the Central Division. Presently there are some 450 or more supervised commercial goat farms in Fiji where management input in the areas of nutrition, breeding, health and stock control are promoted and in most cases adopted. These farms are scattered all over Fiji with a higher concentration in the Western Division.

Solomon Islands

Goats are not traditional animals to most people in the Solomon Islands. They are found throughout the island, and mostly on government farms and those held by missions and schools (Baker and Polke 1985).

In the government and commercial farms, goats are well managed. The aim of the government farms is to breed and distribute goats to smallholder farmers. On government and smallholder farms, grazing is mainly in the day on pastures. Main pasture species grazed are para grass (*Brachiara mutica*) and centro (*Centrosema pubescens*) but are varied in quality and quantity.

Goats grazing is also done under coconuts to control weed to facilitate nut collection similar to

one of the systems in Fiji. Grazing cattle and goats assist in weed control for better pasture usage. Under smallholder production systems goats are generally tethered on native pasture.

Tonga

There are about 15,000 goats in Tonga (Moala 1985). About 85% of the goats are tethered, while in Haapai and Vavau group of islands goats range freely. Village and extensive production system is used and goats are kept mainly for meat purposes. Only a small sector of the population has access to goats, however, there is a good potential for development.

Anglo-Nubian crossbreeds are predominant in the country, but there are also some indigenous goats in the outer islands. Herd ownership range from one to fifty goats as a side line operation to crop production.

Vanuatu

There are about 11,300 goats in Vanuatu and the national consumption of goat meat and milk is low. Over the years there have been no major changes in goat production. Managing goat flocks is often less viable as people have aversion in Vanuatu to eating billies. Majority of goats are found in the villages and others on commercial farms.

Village production systems predominate in Vanuatu and most goats are found in the Tafea region (36%), followed by Eppi (20%), Pentecost (17%), Shepherds (15%) and Santo/Malo (12%). Interest in developing goat production has been expressed by most farmers.

Papua New Guinea

The population of goats is large compared to sheep in PNG and the highest concentration is in the Simbu Province. There is much demand for goats in villages in the Highlands and Island Provinces. However, there are no distribution centres where goats can be obtained. Village and extensive systems are practised in PNG. However, the government has for sometime taken some measures to promote goat production and also aim at improving native breeds through crossbreeding and subsequent distribution to farmers.

Samoa

Goat population in Samoa is small and until recently only one farmer kept goats in Samoa. But recently the University of the South Pacific, School of Agriculture, Alafua Campus has taken the initiative to promote goat production using Anglo-Nubian crossbreeds. The School of Agriculture at present has set to study goats suitability, demand on the environment and social system in Samoa. This start was based on the report of Low (1981), on earlier goat pilot project of USP, SOA in the late 1970s to early 1980s which then influenced a number of individuals in Samoa to start goat farming with small herds. The school also intends to create awareness for the importance of goat production in the country.

A semi-intensive system of production is practised by the sole goat farmer in Samoa. In this system goats graze freely on pasutre under coconut trees during the day and are housed at night in a raised shed and household wastes and crop residues when available are given as supplements in the evenings. However, in the School of Agriculture farm, the goats are confined and all modern day management practices such as feeding, routine and health management are observed.

CONSTRAINTS AND PROPECTS OF GOAT PRODUCTION IN THE REGION

Several factors contribute to the low population and level of production of goats in the South Pacific (Gall and Huhn 1981, Hussain 1985, Baker and Polke 1985, Aregheore and Lungu 1997). These include; current low demand for goat meat in all countries except Fiji and PNG; the taboo that some Island countries' population do not like goat meat; that goat is considered as destructive therefore requires high fence to enclose them; high incidence of losses due to predators like dogs and pigs; the prevailing hot and humid climate in the islands favours gastrointestnal parasites, mainly roundworms and tape worms which affect their health and affects their performance. Others are lack of technical and management skills and poor stock management practices responsible for poor performance of goats. These include lack of access by farmers to credit despite their interest in goat farming therefore production remains at subsistence level, and the social status of goat keepers.

Goats is regarded as the poor man's cow (Aregheore and Lungu 1997), therefore its low level

of acceptance poses as an essential obstacle for all measures in its production. It has been observed that the position in the social hierarchy of people keeping goats in many countries are considered as low and that goats are considered a necessary evil, and there is a danger that development will not extend over a long period of time (Gall & Huhn 1981).

However, goats and other livestock can be conveniently integrated into cropping systems. Due to the small size of smallholder farms, goat is more suitable than cattle. Goat farming will contribute to the diversification of livestock production in the South Pacific region. Farmers with large cattle herd and paddocks can mix goats and cattle for grazing. It has been observed that grazing spectrum of the goat is used. While cattle and sheep prefer grasses and eat almost exclusively these if available, goats browse on any herbs and grasses. (Aregheore & Ikhatua 1997).

Goat meat is a rare commodity and its availability determines its level of consumption in most situations. The high demand for live goats during festival times is a promising indicator of their acceptance as a source of meat (Hussain 1985). Goat milk is highly priced in some communities and is claimed to have dietetic properties, and these properties are said to stem from its better digestibility due to smaller fat globules and a finer texture of the curdled case in as well as antigenic properties which differ from those of cow's milk (Gall, *et al.* 1981). Hide and skin of goats are export commodities which the small island countries can exploit as a foreign exchange earner.

On account of their low unit value, small size, high reproduction rate, short generation interval, inquisitive feeding habits and high digestive efficiency for coarse forages combined with their ability to adapt to variable management systems under different climatic conditions, goats should be encouraged and reared as animal of choice in the South Pacific countries.

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