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Some aspects of crop/livestock production in the Eastern Caribbean - A review

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Pasture and livestock development activities carried out under the CARDI FSR/D programme were reviewed. Studies in Barbados have shown that 25, 40 and 100% of the imported maize in broiler starter, finisher and pig starter rations respectively can be replaced by locally produced cassava. Peanut and sweet potato residues were identified as potential livestock feeds in south-eastern St. Vincent. Pasture and forage bank establishment have taken place in Dominica, Montserrat, Nevis, St. Lucia and St. Vincent. In integrated production systems studies in Dominica, the cut and carry system has reduced the labour requirement of animal production. With some country - specific modifications, it could be extended to other, wetter parts of the region. Improved livestock management systems in Dominica have increased both animal production and vegetable yields, while producing cooking gas through the efficient use of animal manure. Improved rams have been introduced into St. Lucia and St. Vincent, while deworming of sheep at 6 to 8 week intervals has kept internal parasites at manageable levels. Suggestions are made as to the direction of future work.

Keywords: Animal production systems; Local feed production; Improved management

Introduction

Throughout the Caribbean area and especially in the Eastern Caribbean, a large proportion of all farm animals species are kept by small, often landless farmers. Animal rearing by these farmers is often complementary to crop production, to supplement farm income. In most instances the animals are an integral component of the farm system. They are however, often regarded as a 'mobile saving account' rather than a serious commercial activity. There are basically three types of crop/livestock farmers that engage the attention of the USAID-funded Farming Systems Research and Development (FSR/D) teams of CARDI.

- (a) part-time subsistence farmers
- (b) small and medium sized commercial farmers - usually full-time
- (c) large commercial enterprises

In the case of animal production, because a high proportion of the animals are controlled by very small farmers, it is extremely difficult to plan or forecast production on a national or regional level. Nevertheless, animal production contributes significantly to food security in the region. Because of the huge importation (over 1.5 billion EC dollars) of extra-regional livestock products, there is a definite need to revise national and regional livestock development programmes aimed at self-sufficiency.

The major topics being addressed by FSR/D teams in the Eastern Caribbean are shown in Table 1.

Table 1 Areas of Crop/Livestock work being addressed by FSR/D teams in the Eastern Caribbean Countries

Type of Study	Country ¹⁾					
	BDS	SVT	DCA	SLY	MNT	NEV
Feed Resources	yes	yes	no	no	no	no
Forage Production and Development	yes	yes	yes	yes	yes	yes
Integrated Production Systems	no	yes	no	no	no	no

1) Country codes: BDS = Barbados, SVT = St. Vincent, DCA = Dominica, SLU = St. Lucia, MNT = Montserrat, NEV = Nevis.

Feed resources in the region

Feed cost remains the single biggest expense in livestock production. Feed efficiency is therefore of the highest importance.

Cassava as a livestock feed - Barbados

In Barbados, work is ongoing to screen cassava varieties and to develop a feed with a high proportion of cassava. The philosophy is that locally grown and processed cassava can be used to replace some of the imported corn used in concentrate feeds. Feeding trials have been carried out using cassava to replace 25 and 40 percent of the corn in broiler starter and finisher rations respectively and 100 percent of the corn in the pig starter ration.

There were no significant differences in average daily gain and feed efficiency for broilers and piglets on the rations containing cassava, when compared to the commercial rations.

Crop residue availability - A survey in St. Vincent

In St. Vincent a survey was done to identify local feed resources used by livestock farmers in one agricultural district (4 East). Peanuts were sown on 69 percent, and sweet potatoes on a further 23 percent of the area surveyed. The remainder of the land was sown to 10 other crops, including 0.3 percent to Pangola grass *Digitaria decumbens*. Clearly, the tops of peanuts and sweet potatoes constitute the bulk of the crop residues that could be used for feeding livestock.

Forage production and development

Forages probably constitute the most economical and efficient way to feed ruminant animals. The livestock industry in most CARICOM states, however, is based on imported feeds and native vegetation, with only limited use of improved grasses and forage legumes.

Several CARDI teams have ongoing development programmes to improve local forage 'banks' by introducing productive and adapted grass and forage legume species. Table 2 summarises the work done in forage development by FSR/D teams in the Eastern Caribbean.

Table 2 Summary of FSR/D forage production activity by country

Forage Production Activity	Country ¹⁾				
	DCA	SVT	NEV	MNT	SLU
Establishment of Forage Banks	yes	no	yes	yes	yes
Pasture Development/Improvement	yes	yes	no	yes	yes
Forage Conservation	yes	no	no	yes	yes

1) Country codes: DCA= Dominica, SVT = St. Vincent, NEV = Nevis, MNT = Montserrat, SLU = St. Lucia.

There is forage activity in other countries in the Eastern Caribbean, but under different projects, which do not fall within the scope of this review. Tables 3 and 4 indicate the important species of grasses and legumes used in forage and protein energy banks in the region.

Pasture management is a form of husbandry largely neglected by livestock farmers throughout the region. The belief is that because grass grows easily in the tropics, there is no need to give the same level of care and attention to forage crops that are required by other crops. However, to obtain the maximum results it is necessary to select the correct grass/legume species, then manage them as an economic crop.

Integrated production systems

Under this heading will be discussed the livestock management system (LMS) in Dominica, the Dominica Roseau Valley Project, the deworming intervals and use of anthelmintics in St. Lucia and introduction of improved sires (rams) in St. Vincent and St. Lucia.

Livestock management systems

The livestock management system (LMS) in Dominica is a four - component model which incorporates cut/carry forage plots, an extensive grazing area, the extensive grazing and cut/carry herds.

Recently, on some of the farms associated with the LMS, biogas units have been introduced to efficiently dispose of farm waste, while yielding tangible benefits in cooking gas, slurry and manure.

The original rationale of the cut/carry system was to alleviate the forage supply problem and reduce the drudgery and time loss associated with tending animals long distances away from home or work.

Table 3 Indigenous and introduced grass species used in Forage Banks and pastures in the Eastern Caribbean

Common Name	Species Name
Pangola grass	<i>Digitaria decumbens</i>
Elephant grass	<i>Pennisetum purpureum</i>
Guinea grass	<i>Panicum maximum</i>
Bambatsi	<i>Panicum coloratum</i>
Setaria	<i>Setaria anceps</i>
Chrysopogon	<i>Chrysopogon sp</i>
Giant African Stargrass	<i>Cynodon spp.</i>
Bermuda grass	<i>Cynodon spp.</i>

Table 4 Indigenous and introduced forage legume species used in protein energy banks and pastures in the Eastern Caribbean

Common Name	Species Name
Stylo	<i>Stylosanthes hamata</i>
Glycine	<i>Neonotonia wightii</i>
Siratro	<i>Macroptilium atropurpureum</i>
Leucaena	<i>Leucaena leucocephala</i>
Rabbit Vine	<i>Teramnus labialis</i>
Calopo	<i>Calopogonium sp.</i>
	<i>Rhynchosia sp.</i>
Desmodium	<i>Desmodium intortum</i>

Cut and carry forage plots: Several improved grass and forage legume species were introduced. Of the legumes, *Desmodium* and *Stylosanthes* were the most persistent in mixed stands, gave a higher dry matter yield and competed most effectively against weeds. Elephant grass, which is well suited to the cut/carry system was found to be very productive under the conditions of high rainfall in Dominica. Yields as high as 25 - 31 t/ha/yr of dry matter have been realized.

The extensive grazing area: Animals are moved from the intensive rearing area in the cut/carry system to the extensive grazing area in the hills. This movement occurs usually when the cows are pregnant but not lactating. They are moved back into the system before calving or when they are again producing milk. It is difficult to estimate forage production in the extensive grazing areas, as there are varying species with variable levels of productivity.

The extensive grazing herd: This component is represented by the animals grazing in the native pastures in the hills. Not much care is given to the animals in the system at this stage, except for occasional watering and movement from one location to another.

The cut and carry herd: The only difference between the extensive grazing and the cut/carry herd is possibly one of physiological status. The cut/carry herd is usually lactating and supporting calves, while the extensive herd is usually dry and pregnant, or in very early lactation.

Over the past three and a half years the LMS has been studied by many persons, both within and outside of CARDI, and there are now the basic guidelines to develop a framework to analyze what is going on in this four component system and the interactions between sub-systems. There is the suggestion that a 5 - component system should be studied, since vegetable production has been found to be closely inter-related with the LMS. There are gaps in the information currently available, but a start has been made.

Computer templates have been developed for entering the data. All the templates include spaces to enter monthly inputs.

Roseau Valley Dairy Project

Some of the developments of the LMS in Dominica, such as livestock pens, the unique watering system of drums welded together and cut/carry forage plots, have already been transferred to dairy farmers within that country. The Roseau Valley Dairy project therefore is an extension of the LMS.

The main achievements of the project which ran from December 1984 to January 1986 were:

- (1) Improved calving intervals due to better heat detection and earlier rebreeding (better reproductive efficiency). Open days were reduced from 335 to 141 days.
- (2) Increased lactation length from a range of 150 - 175 up to an average of 238 days per animal.
- (3) Increased milk production (range of 525 - 613 litres up to 952 litres per cow per lactation).
- (4) Overall upgrading through training of the dairy farmers on the project.

Introduction of Improved Sires

A survey done among small ruminant livestock producers in the South East of St. Vincent identified the shortage of good quality sires as a major constraint. As a result, two rams, secured at no cost from the Ministry of Agriculture in Barbados, were provided to farmers in St. Vincent. The rams are already in service and doing well.

In a similar exercise to upgrade sheep in the La Pointe/Delcer/Industry areas of Choiseul, St. Lucia, ten Blackbelly rams were imported from Barbados and distributed.

Internal Parasite Study

Wherever sheep are raised, internal parasites (worms) will be found. Worms are probably the biggest health hazard in the region.

A Programme to test four deworming intervals (6, 8, 10 & 12 weeks), and three anthelmintics (Levamisole, Synanthic and Panacur) was started in St. Lucia in January 1985 with four groups of farmers. The farms spanned two agro-ecological zones representing the dry north and the wetter central areas.

Pretreatment fecal counts revealed a high incidence of *Strongyles*, *Strongyloides* and *Monezia*. There were difficulties with this programme, mainly due to a high turnover rate of farmers, farmer indifference in one area, sale of experimental animals without notice and death of many project animals during the recent drought. These factors make the results incomplete or somewhat unreliable. Nevertheless, the general observations were that fecal counts were kept at manageable levels under the 6 and 8 week deworming intervals, but not at the longer intervals.

Suggestions for future direction

There is urgent need to intensify efforts on the development of animal feeds incorporating as high a proportion of locally produced ingredients as possible. Emphasis needs to be placed on the following areas:

- (1) Forage production and conservation.
- (2) Greater use of indigenous products and by-products for feeding.
- (3) Selective breeding to provide good breeding stock for future generations.
- (4) Outreach/extension programmes to promote aspects of live-stock development.
- (5) The provision of adequate incentives to production.
- (6) The implementation of policies, particularly with regard to importation, to stimulate local animal production.