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ECONOMIC ANALYSIS OF GOAT PRODUCTION

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Economics Analysis of Goat Production
on North Andros, Bahamas

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The BARTAD Project is doing research aimed at improving goat production in the local agricultural economy. There are several reasons for this attempt:

1. A substantial quantity of goat meat is imported into the country. In 1974, this amounted to 260,000 pounds and represents a per capita* consumption of 1.4 pounds of imported goat meat per year. The imported goat meat was valued at \$240,000.
2. There are many farmers in the Bahamas who raise goats on a small scale on unimproved pastures with the animals grazing native plant species. Only limited attempts are made to select stock. These factors, combined with inadequate nutrition, has resulted in small, poor-quality stock.
3. Goats are hardy and can tolerate a lower level of management than sheep or cattle.
4. On Andros alone, there are 15,000 acres of accessible class III land unsuitable for row crop production but which may be well suited to goat production.

At BARTAD the approach to intensive goat production involved the establishment and fencing of improved pastures for rotational grazing. This was followed by the introduction of improved Nubian bucks to produce heavier market goats from native does and $\frac{1}{2}$ Nubian - $\frac{1}{2}$ native does. Research results from the research station and pilot test farms have indicated that faster growth rates and market animals with heavier and better quality carcasses resulted from these practices. However, it is the profitability of goat production, which will determine its feasibility in any farm enterprise mix.

There are several factors that will determine profitability. Probably the most important factor under local conditions is pasture costs. The natural vegetation on Andros is pine which must be removed before the land is seeded to pastures. This is a major undertaking and involve costs which have to be amortized over several years. A farmer without the necessary capital would have to borrow the money and pay the necessary interest and principal charges.

Another important factor affecting profitability is the management ability of the operator involved in goat production. Operators on Andros are not traditional livestock farmers and it has been necessary to train them from scratch. Good management ability will be reflected in a high number of kids raised per doe annually and good finishing weights.

*1974 population estimated at 187,000

Probably the foremost factor determining profitability will be the price paid for goat meat. Research on Andros which may or may not be applicable to the whole Bahamas indicate that goat meat is not as popular in the Bahamian diet as chicken or pork. Therefore, the availability and price of these other meats will affect the price of goat meat. As indicated in the import statistics, however, there is a sizable market demand to be filled.

The biggest part of this market however is in Nassau and Freeport where 80 percent of the population reside. The local Andros market can absorb only 800 heads per year. After the local market is satisfied the goat farmer will face the problem of marketing goats off the island and thus transportation will become an added cost factor in production. Finally goat prices will be affected by imported goat products and in the absence of import restrictions, his price must be competitive if he is to survive.

Two management levels are considered in this report. The first is a low intensity management system to reflect profitability under pilot test farm conditions. The other is a high intensity management system which analyzes performance on the research station. The analysis of the two alternative systems gives an indication of the range of conditions that may occur on future Bahamian farms of mixed enterprises.

Pasture Establishment for Goats

The major cost item for goat production is the feed necessary to maintain a goat flock and finish kids. Pasture and hay are the major feed items produced on the research station and pilot test farms. Therefore, an analysis of pasture and hay costs is necessary in analyzing the goat enterprise. For pasture grazing animals such as goats feed requirements are expressed in terms of the pasture carrying capacity or number of animals carried per acre. For stored feed such as hay or silage it is the quantity of dry matter required over time. Animal unit carrying capacity relates the feed requirements or consumption of different types or species of livestock. One mature doe with or without kids represent .20 animal unit and consumes 5.25 pounds of dry matter per day.

Table 1. Feed Requirements for Goats, Animal Unit Equivalent and Pounds of Dry Matter

<u>Class of Goats</u>	<u>Animal Unit</u>	<u>Pounds D.M.</u>
a) Doe with or without unweaned kid	.20	5.25 lbs/day
b) Weaned kid	.12	2.5 lbs/day
c) Buck	.26	6.0 lbs/day
d) Doe & 1.92 kids grazing 3 months	.267	2,348 lbs/day

Two main types of improved pastures have been established on the research station and pilot test farms.

1. A mixture of several different high yielding tropical grasses - guinea, Buffel, Rhodes and legumes - Siratro, Desmodium and glycine.
2. An alfalfa - buffel grass mixture.

On the pilot test farms, the ratio of the two types of pastures are approximately 75 percent tropical legume-grass to 25 percent alfalfa-buffel.

The tropical grass-legume pasture has provided the bulk of the summer grazing while the alfalfa because of adaptibility to colder temperatures and its deep-rooted system has provided the greater part of the winter grazing. It is the animal unit carrying capacity of pastures during the dry winter season that will primarily determine the level of feed costs per doe and kid in a year round pasture system.

Animal Unit Carrying Capacity of Improved Goat Pastures - High Intensity Management

On the research station small plot yields have given the first indication of animal unit carrying capacity of improved grass-legume pastures. These yield tests conducted under close supervision and competent management indicate that a wet season carrying capacity of 2.4 animal unit per acre is possible. Dry season plot yields have averaged 393 pounds of dry matter per acre per month. This was for the months of January - March and represent a carrying capacity of 1.1 animal unit per acre. These results assume complete pasture utilization and no feed losses.

On a tropical grass-legume trial, the carrying capacity averaged 1.1 animal units per acre from November, 1976 to March 1977. This represents 5.5 mature does per acre. This trial was conducted on a strict rotation schedule involving 1 week grazing, and 3 weeks rest period. No grazing results are available from alfalfa-buffel grass pastures under high management conditions.

Animal Unit Carrying Capacity of Combination Pastures on Pilot Test Goat Farm

On the pilot test goat farm, pastures of tropical mixed grass-legume and alfalfa-buffel grass are rotationally grazed. The farmer is responsible for his rotation schedule but technical advice has been provided at all time. Wet season carrying capacity was difficult to compute since animals were introduced to the pastures over a period of 5 months from June to October of 1976.

During the winter months of 1976-77, the combination pastures carried 0.5 animal units per acre. This represents 2.5 mature does per acre. There was a limited amount of hay feeding but this was because it was available for use.

Pasture Costs - Low Intensity Management

Pasture budgets are presented for tropical grass-legume and alfalfa-buffel grass pastures. They are then combined to reflect the proportional mix of the two types of pasture under farm conditions.

The budgets were developed using input levels a farmer should use to get the yields given in this report. Machine costs are taken from Final Report #13. Interest charges of 4% on land costs reflects the difference between the prime rate of borrowing money and the rate of land appreciation. The total annual cost for the tropical legume-grass and alfalfa-buffel grass pastures are \$168.03 and \$272.53 respectively. The cost per acre of the combination is \$194.15.

Table 2. Cost of Producing Grass-Legume Pasture Per Acre - Low Management, Andros, Bahamas

	<u>Quantity</u>	<u>Price</u>	<u>Cost</u>
I. <u>Establishment Costs</u>			
A. Seed - Buffelgrass	2 lbs.	\$4.00	\$ 8.00
Rhodesgrass	2	9.78	19.56
Siratro	2	2.62	5.24
Greenleaf Desmodium	2	4.07	8.14
Glycine	2	1.33	<u>2.66</u>
Total Seed			\$ 43.60
B. Fertilizer - 8-18-8	0.75 ton	\$205.00	\$153.75
C. <u>Machine Use (includes labor)</u>			
Disking (twice) D-4	1.0 hr.	\$18.82	\$18.82
Grid Rolling D-8	0.33	60.04	19.81
Fertilizing JD 2030	0.15	17.84	2.68
Seeding JD 2030	1.2	16.36	<u>19.64</u>
Total Machine Use			\$ 60.95
D. Other Labor	0.5 hr.	2.00	\$ 1.00
E. Interest on cleared land	\$200 x 4% x $\frac{1}{2}$ yr		\$ 4.00
F. Interest on seeding investment	\$263 x 12% x $\frac{1}{2}$ yr		<u>\$ 15.80</u>
Total Establishment Cost			\$279.10
II. <u>Annual Maintenance Costs</u>			
A. Fertilizer - 0-20-15	0.5 ton	\$143.04	\$ 71.52
B. Machine Use (includes labor)			
Fertilizing (twice) JD 4230	0.3 hr.	\$ 17.84	\$ 5.35
Clipping (3 times) JD 4230	1.5 hr.	15.52	23.28
Total Machine Use			\$ 28.63
C. Other Labor	1 hr.	2.00	\$ 2.00
D. Interest on Cleared Land	\$200 x 4%		\$ 8.00
E. Interest on Maintenance Costs	\$110 x 12%		<u>\$ 13.22</u>
Total Annual Maintenance Cost			\$123.37
III. <u>Annual Fixed Costs</u>			
Depreciation on Establishment Costs - 10 year life			\$27.91
Interest on average investment cost for establishment	\$263.30 x 12% x $\frac{1}{2}$		<u>\$16.75</u>
Total Annual Fixed Cost			\$ 44.66
IV. Total Annual Cost			\$168.03

Table 3. Cost of Producing Alfalfa-Buffel Grass Pasture - Low Management at, Andros, Bahamas

I. <u>Establishment Costs</u>	<u>Quantity</u>	<u>Price</u>	<u>Cost</u>
A. Seed - Alfalfa	20 lbs.	\$1.02	\$20.40
Buffelgrass	2 lbs.	2.76	<u>5.52</u>
Total Seed			\$ 25.92
B. Fertilizer - 8-18-8	0.75 ton	\$205.00	\$153.75
0-46-0	0.25 ton	178.00	<u>44.50</u>
Total Fertilizer			\$198.25
C. Machine Use (includes labor)			
Disking (twice) D-4	1.0 hr.	\$ 18.82	\$ 18.82
Grid Rolling D-8	0.33	60.04	19.81
Fertilizing JD 4230	0.15	17.84	2.68
Seeding JD 2030	1.2	16.36	<u>19.64</u>
Total Machine Use			\$ 60.95
D. Other Labor	0.5 hr.	2.00	\$ 1.00
E. Interest on Cleared Land	\$200 x 4% x $\frac{1}{2}$ year		\$ 4.00
F. Interest on seeding investment	\$258 x 12% x $\frac{1}{2}$ year		<u>\$ 15.49</u>
Total Establishment Costs			\$305.61
II. <u>Annual Maintenance Costs</u>			
A. Fertilizer - 0-20-15	0.4 ton	\$143.04	\$ 57.22
0-46-0	0.125	178.00	<u>22.25</u>
Total Fertilizer			\$ 79.47
B. Chemicals			\$ 10.00
C. Machine Use (includes labor)			
Fertilizing (twice) JD 4230	0.3 hr.	\$ 17.84	\$ 5.35
Clipping (3 times) JD 4230	1.5	15.52	23.28
Spraying (twice) JD 2030 & Myers Sprayer	1.0 hr.	16.95	<u>16.95</u>
Total Machine Use			\$ 45.58
D. Other Labor	1.0 hr.	2.00	\$ 2.00
E. Interest on Maintenance Costs	127.05 x 12%		<u>\$ 15.25</u>
Total Annual Maintenance Costs			\$152.30
III. <u>Annual Fixed Costs</u>			
Depreciation on establishment costs - 3 year life		\$101.87	
Interest on average investment cost for establishment	\$314 x 12% x $\frac{1}{2}$		<u>18.36</u>
Total Annual Fixed Costs			\$120.23
IV. Total Annual Cost			\$272.53

Table 4. Summary of Costs of 3/4 Tropical Grass-legume, 1/4 Alfalfa buffel grass Pasture Combination per Acre, Andros, Bahamas

	<u>Tropical</u>	<u>Alfalfa-Buffel</u>	<u>Combination</u>
Establishment Cost	\$279.10	\$305.61	\$285.73
Estimated Stand Life	10 years	3 years	-
Annual Fixed Costs	\$ 44.66	\$120.23	\$ 62.53
Annual Maintenance Cost	<u>\$123.37</u>	<u>\$152.30</u>	<u>\$131.73</u>
Total Annual Cost Per Acre	\$168.03	\$272.53	\$194.15

Table 5. Calculated Pasture Yields under Pilot Test Farm Management, Andros, Bahamas

Stocking Rate in Animal Units			.5AU/Ac
Dry Matter Per Animal Unit - $\frac{5.25 \text{ lbs/day} \times 365 \text{ days}}{.2\text{AU}}$	=	9581	lbs/A.U.
Dry Matter Requirement Per Animal Units - $9581 \text{ lbs/AU} \times .5 \text{ AU/acre}$	=	4790.5	lbs/acre.

Pasture Costs - High Management

The high management costs reflect those on the research station. High management implies closer attention to pasture grazing, fertilization, clipping and other maintenance chores. Fertilizer rates under high management are higher than under low intensity management. Hay would be harvested during the wet season to supplement pasture during the dry season.

Hand harvested yields from alfalfa-buffel pastures amounted to a total yield of 8.33 tons of dry matter per acre. That from tropical grass-legume amount to 7.27 tons of dry matter per acre. If these figures are converted to an average pasture situation of 75 percent tropical grass-legume and 25 percent alfalfa buffel the total yield would have been 7.55 tons of dry matter per acre.

Under field conditions, one could assume a yield utilization of 75% by grazing goats if one relates plot yields to animal unit carrying capacity obtained in research station grazing trials.

The total cost of feed per acre for doe and kid under high management is \$350.63. This amounts to \$72.59 per doe per year at a stocking rate of 4.83 does per acre.

Table 6. Cost of Producing Mixed Grass-legume Pasture Per Acre - High Management
Andros, Bahamas

Pilot test farms '8.

<u>I. Establishment Costs</u>	<u>Quantity</u>	<u>Price</u>	<u>Cost</u>
A. Pilot Test Farm costs less interest on fertilizer and seed costs			\$109.55
B. Fertilizer	1 ton	\$205.00	205.00
C. Interest on Seeding Investment	$\$314.55 \times 12\% \times \frac{1}{2}$		<u>18.87</u>
Total Establishment Costs			\$333.42
<u>II. Annual Maintenance Costs</u>			
A. Pilot Test Farm costs less fertilizer & maintenance interest			\$ 38.63
B. Fertilizer - 0-20-15	1 ton	\$143.04	143.04
C. Interest on Maintenance Costs	$181.67 \times 12\%$		<u>21.80</u>
Total Annual Maintenance Costs			\$203.47
<u>III.</u>			
A. Annual establishment costs - 10 year life			\$ 33.34
B. Interest on average investment			<u>20.00</u>
Total Annual Cost			\$ 53.34
			\$256.81

Table 7. Cost of Producing Alfalfa-Buffel Grass Pastures Per Acre - High Management, Andros, Bahamas

<u>I. Establishment Costs</u>	<u>Quantity</u>	<u>Price</u>	<u>Cost</u>
A. Present mgt. costs less fertilizer & seeding interest (same as average management)			\$ 91.87
B. Fertilizer - 8-18-8	1.0 ton	\$205.00	205.00
0-46-0	0.25 ton	178.00	44.50
C. Interest on seeding investment	$350.37 \times 12\% \times \frac{1}{2}$		<u>21.02</u>
Total Establishment Cost			\$362.39
<u>II. Annual Maintenance Costs</u>			
A. Present mgt. costs less fertilizer & maintenance interest			\$ 57.58
B. Fertilizer - 0-20-15	0.5 ton	\$143.04	71.52
0-46-0	0.25 ton	178.00	44.50
C. Interest on maintenance costs	$173.60 \times 12\%$		<u>20.83</u>
Total Annual Maintenance Costs			\$194.43
<u>III. Annual Fixed Costs</u>			
A. Annual establishment costs - 3 year life			\$120.80
B. Interest on average investment cost for establishment	$362.39 \times 12\% \times \frac{1}{2}$		<u>21.74</u>
Total Annual Fixed Cost			\$142.54
IV. Total Annual Cost			\$336.97

Table 8. Cost of Harvesting, Storing, and Feeding Hay from Surplus Pasture, Per Ton, Andros, Bahamas

<u>I. Harvesting Costs</u>	<u>Quantity</u>	<u>Price</u>	<u>Cost</u>
Mower-conditioner	.53 hrs/Ac.	\$13.76	\$ 7.29
Rake (twice)	.61	3.58	2.18
Baler	.51	6.70	3.42
Tractor Cost for Mowing, Raking & Baling	1.65	10.29	16.98
*Labor for loading hay on wagons & stacking into storage	2.04	2.00	<u>4.08</u>
Total Cost Per Acre			\$33.95
Harvesting Cost per ton	\$33.95 ÷ 0.5 ton/acre		\$67.90
Storage Cost per ton			10.00
Feeding cost per ton (5 feedings of 400 pounds ½ hour per feeding) 2.5 hours per ton @ \$2.50			<u>5.00</u>
Total Cost Per Ton			\$82.90

Table 9. Costs of 3/4 Tropical Grass-legume, 1/4 Alfalfa-Buffel Grass Combination Per Acre - High Management, Andros, Bahamas

	<u>Tropical</u>	<u>Alfalfa-Buffel</u>	<u>Combination</u>
Establishment Cost	\$333.42	\$362.39	\$340.66
Estimated Stand Life	10 years	3 years	-
Annual Fixed Costs	53.34	142.54	75.64
Annual Maintenance	203.47	194.43	<u>201.21</u>
Total Annual Cost-Pasture			\$276.85
Hay Harvesting, Storing & Feed Cost .89 Ton @ \$82.90/ton			\$ 73.78
Total Annual Cost - Pasture and Hay			\$350.63

*Assumes 2 men to stack hay on wagon behind baler and 2 men to unload wagons into storage while baling. Machine operator labor costs are included in tractor price.

Table 10. Pasture Yields and Hay Requirements by Quarter Under High Management

	<u>Jan- March</u>	<u>April- June</u>	<u>July- Sept.</u>	<u>Oct.- Dec.</u>	<u>Annual</u>
	<u>Tons Dry Matter/Acre</u>				
Alfalfa-Buffel Small Plot Yield	1.03	3.15	2.86	1.30	8.33
Tropical Small Plot Yield, 1975	0.59	2.45	2.04	2.19	7.27
Average 75% Tropical-25% Alfalfa- Buffal	0.70	2.63	2.25	1.97	7.55
Utilization by Goats		75% of small plot yield			
	.53	1.97	1.69	1.48	5.67
Quarterly Requirement					
2,348 lbs/doe x 4.83 does/acre ÷ 4	1.42	1.42	1.42	1.42	5.67
Surplus or Deficit to be supplied by Hay	.89 +	.55 +	.27 +	.06	
Total Dry Matter Required as Hay Per Ac.					.89 Ton

Capital Investment and Annual Fixed Costs

A BARTAD pilot test farmer would establish about 20 acres of improved pastures. The other major capital investments for a goat enterprise would be land clearing, fence, wells and improved livestock. He needs to budget approximately \$15,000 to cover these investments.

Table 11.

Land Clearing 20 acres @ \$100/acre	\$ 2,000.00
Fence	5,000.00
Wells 2 @ 120	240.00
Livestock 50 does @ \$65 + 1 buck @ \$250	3,500.00
Pastures 20 acres @ \$195	<u>3,900.00</u>
Total Capital Investment	\$14,640.00

The above represents an investment of \$732 per acre of improved pasture. When stocked at a rate of 2.5 does per acre, under low management, this is an investment of \$293 per doe.

Fencing improved pastures is expensive. The most reliable fence consists of 32" woven wire flush with the ground topped by three strands of barbed wire. The twenty acres of pastures would most likely be divided into 6 equal sized paddocks

to allow for rotational grazing. This would require 6612 feet of fence. The contract price for constructing such a fence is \$.75 per linear foot including machinery and labor. A farmer could reduce his cash costs by building fences himself. He would then have an opportunity cost for his labor, which may or may not be less than hired labor costs. Depreciation on fence and other facilities is 20 years and interest is 12% on average investment. The total annual fixed costs for livestock and facilities amount to \$1,047.23. This is \$52.36 per acre. If stocked with 50 does, total annual fixed cost per doe is \$20.94.

Table 11. Estimated Initial Investment and Annual Fixed Costs for Goats, Buildings Fencing, Equipment & Pastures, Andros, Bahamas

	<u>New Cost</u>	<u>Avg. Investment</u>	<u>Expected Life Years</u>	<u>Depr.</u>	<u>Interest</u>	<u>Total</u>
I. Goats 50 does @ \$65 & 1 buck @ \$250	\$3,500.00	\$1,750.00	-	-	\$420.00	\$420.00
II. Fences	4,958.25	2,479	20	\$247.91	297.48	545.39
III. Gates 6 @ \$64	384.00	192	20	19.20	23.04	42.24
IV. Wells 2@ \$120	240.00	120	20	12.00	14.40	26.41
V. Water troughs 6 @ \$20	120.00	60	20	<u>6.00</u>	<u>7.20</u>	<u>13.20</u>
Total - 50 Does				\$285.11	\$762.12	\$1047.23
Total Per Doe				\$ 5.70	\$ 15.24	\$ 20.94

Goat Costs and Returns Budgets

Two costs and return budgets are presented to reflect results at two management levels.

Table 12. Costs & Return Per doe - Average Price & Low Intensity Management, Andros, Bahamas

<u>A. Income</u>	
1. Sale of slaughter goat 1.2 kid/doe/yr x 50 lbs. x \$.60/lb x 50% slaughtered	= \$ 18.00
2. Sale of culled doe 60 lb. x \$.60/lb X 10% slaughtered	= 3.60
3. Sale of breeding does 1.2 kids/doe/yr x \$65/hd. x 40% sold	= <u>31.20</u>
Total Income	\$ 52.80
<u>B. Variable Costs</u>	
Breeding	\$ 2.00
Vet and Drugs	3.26
Supplies	.30
Fence Maintenance (2% of initial investment)	<u>2.00</u>
Total Operating Cost	\$ 7.56
<u>C. Feed</u>	
1. Pasture 2.5 does/acre @ \$195.02/Acre/yr. (Table 4)	\$ 78.00
2. Supplement (Minerals)	.48
3. Hay	<u>-</u>
<u>D. Fixed Cost (Table 11)</u>	
1. Depreciation on Fence & Equipment	5.70
2. Interest on Fence & Equipment	6.84
3. Interest on doe \$65 @ 12%	<u>7.80</u>
Total Fixed and Variable Costs	\$106.38
Net Return to labor and Management	- \$ 53.58

Labor Requirements

Total	JFM	AMJ	JAS	OND
10	3	3	2	2

Analysis of low management system

The data in the budget reflects conditions that have occurred on the pilot test goat farm over the past year. Does kidded once per year and averaged 1.2 kids weaned per doe. Wether kids marketed from the farm weighed an average of 50 lbs. at 6 months and sold for \$.60/lb. liveweight; and 10% of the young does

went for replacement and 40 percent for sale as female breeding stock. The gross income from the budget amounts to \$52.80 per doe.

A low dry season carrying capacity of 2.5 ewes per acre make feed costs 73.8% of total costs. Fixed costs, including depreciation and interest on fence and equipment amount to \$20.34. The net return to labor and management under this system is \$-53.78. Assuming 10 hrs. of labor per doe, the return labor is \$-5.38 per hour. With a flock of 50 does the net returns would be \$-2,689, and the farmer would utilize 500 hours of labor.

Table 13. Costs and Returns ^{pr. doe} for High Intensity System, Andros, Bahamas

A. Income

1. Sale of slaughter goat 1.92 kids doe/yr x 60 lb market wt. x \$.60/lb x 50% slaughtered	= \$ 28.80
2. Sale of culled ewe 60 lbs x \$.60/lb x 10% slaughtered	= 3.60
3. Sale of breeding stock 1.92 kids/doe/yr x 65/hd x 40% sold	= <u>49.92</u>
Total Income	\$ 82.32

B. Variable Costs

Breeding	\$ 2.00
Vet & Drugs	3.26
Supplies	.30
Fence Maintenance (20% of initial investment)	<u>2.00</u>
Total Operating Cost	\$ 7.56

C. Feed

1. Pasture and Hay 4.83 doe/acre/yr. @ \$350.63 (Table 9)	\$ 72.59
2. Supplement (Minerals)	<u>.48</u>
Total Feed	\$ 73.07
Total Variable Costs	\$ 80.63

D. Fixed Cost

1. Depreciation on Fence & Equipment	\$ 5.70
2. Interest on Fence & Equipment	6.84
3. Interest on doe \$65 @ 12%	<u>7.80</u>
Total Variable & Fixed Costs	\$100.97
Return to Labor & Management	\$-18.65

Labor Requirements

TOTAL	JFM	AMJ	JAS	OND
10	3	3	2	2

The high intensity budget reflects the conditions that prevail with the research station's goat flock. With an eight-month accelerated kidding schedule and optimum nutrition of does, 1.92 kids are weaned per doe per year and 10% of the young does are retained for replacement.

Wethers kids marketed on bid averaged 50 lbs live weight and sold for an average price of \$.60 per pound. The demand for good female breeding stock is brisk at a sale price of \$65 per head. All slaughter animals were picked up at the site and, therefore, no marketing costs are involved. Gross income per doe under this system amounts to \$82.32.

The pasture carrying capacity of 4.83 does/acre represent the average year-round stocking rate when hay is used to supplement reduced pasture production in the dry season. At this stocking rate feed costs are 72 percent of total costs.

The fixed costs include depreciation and interest on fence and equipment and interest on does for a total of \$20.34. The net return to labor and management is \$-18.65. Assuming 10 hours of labor per doe, return to labor is \$-1.86 per hour. With a flock of 96 does the returns would be \$-1790.4 and the farmer would utilize 960 hours of labor.

SUMMARY

Research at BARTAD has indicated that intensive goat production is possible on Andros. Intensive production however, requires high investment costs in breeding stock, fences, land clearing and pastures. Pasture maintenance costs are also high.

At the low intensity management level experienced on pilot test farms, feed costs alone exceed gross returns. This is a result of high pasture establishment and maintenance costs and low pasture carrying capacity during the dry season. Production is unprofitable even at the high management level attained on the research station. Under high management, gross returns slightly exceeds total variable costs. (*Variable + Feed Costs*)

Pasture carrying capacity would have to increase to 6.59 does/acre to break even on a total cost basis. This in addition to a higher market price for goat meat may make goat production profitable at high levels of management.

Recommendations

Increased local production of goat meat will assist the efforts to achieve the goal of agricultural self-sufficiency in the near future. Since profitable goat production under present conditions is not possible, certain actions could be taken to enable local goat enterprises to operate profitably.

1. Provide all of the major investments such as land clearing, fencing, pasture establishment and possibly the initial breeding herd free to the farmer.

2. Livestock extension personnel should continue to assist farmers raise their level of management.
3. Subsidize the price of goat meat at a level which would give a reasonable return to management and labor or introduce tariffs or embargoes to raise the price of imported goat meat to a price which would enable the local farmer to compete.
4. Continue research into less expensive methods of establishing goat enterprises, perhaps on old vegetable land where fertilizer needs would be less than on new land.