CATTLE PERFORMANCE AND ECONOMIC POTENTIALS OF ALTERNATIVE STOCKER AND FINISHING PROGRAMS FOR FALL-WEANED CALVES

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CHAPTER I

INTRODUCTION

In an effort to obtain greater returns to apply against increasing cow maintenance costs, cow-calf producers may elect to retain ownership of their weaned calves through the stocker and possibly feedlot phases of production. If sound economic decisions are to be made, specific questions relative to alternative beef production systems must be addressed. Cattle performance on optional stocker programs and its effect on subsequent feedlot performance are key considerations.

In areas where clean-tilled wheat pasture has traditionally been used to winter fall-weaned calves, grazing costs have been steadily increasing (10 to 15% per year). An alternative stocker program for producers who do not have wheat pasture available to them and do not want to rent wheat pasture would be to retain stocker cattle on bermudagrass pastures and feed bermudagrass hay.

Bermudagrass hay harvested at an early stage of growth (May and June) would be of high quality (McCroskey et al., 1968), but digestibility and crude protein of bermudagrass declines rapidly with advancing maturity (Wilson et al., 1977). Feeding high quality bermudagrass provides a means of carrying stocker cattle, while producing substantial gains (Hart et al., 1976).

When hay quality is low, however, which is often the case, producers often elect to maintain stocker cattle on a lower plane of

nutrition by feeding this hay, with a minimum of additional supplementation. It is generally expected that cattle carried through a prolonged period on a low plane of nutrition (near maintenance levels) will make compensatory gains when placed on a higher level of nutrition. Therefore, weight loses of stockers incurred during the period on the low plane of nutrition would be recovered. However, the extent of the recovery of weight gains and economic losses incurred during the maintenance period should be considered by producers before choosing this production alternative.

Grazing stocker cattle on small grains-interseeded bermudagrass pastures is another alternative. Although winter grazing may be limited, derived benefits would be the extension of an existing stocker program. Forage dry matter production (metric tons/hectare) of rye grass interseeded Coastal bermudagrass pastures was very similar during March and April to that of ryegrass grown on clean-tilled land (Utley et al., 1976), and attests to the forage production potential of interseeded bermudagrass pastures.

Finishing cattle by feeding grain on pasture is a frequently suggested alternative beef production system (McClaugherty et al., 1975; Utley and McCormick, 1976; Lowrey et al., 1976a; Lowrey et al., 1976b; McCampbell et al., 1976; Burris et al., 1976; Spooner and Ray, 1977). However, in many studies where grain has been fed to cattle on grass, the experimental design was such that total feed intake per kg of body weight gain could not be partitioned into forage and grain components. Since the contribution of forage to beef weight gains was not taken into account, feed efficiencies (kg feed per kg gain) were not accurately determined.

CHAPTER II

REVIEW OF LITERATURE

Forage Quality and Performance of Steers on Forage Programs

Small Grains

Wyatt (1977) reported that small grains forage provides an excellent source of nutrients for cattle, and usually contains 25 to 30% crude protein and 65 to 75% TDN on a dry matter basis. Under dry land conditions, forage yields of 2240 to 5600 kg of dry matter per hectare are common with production potentials of 224 to 560 kg of beef per hectare.

Gains of cattle on small grains forage are usually excellent. Boomer (1972) reported average daily gains of steers of 1 kg per day with continuous grazing during a 4 year study. Elder (1967) and Horn et al. (1974) reported average daily gains of steers on wheat pasture ranging from .59 to .75 kg. Daily gains of 1.11 kg per head per day for steers grazing oat pasture stocked at 2.5 head per hectare were reported by Gulbransen (1976).

Harvested Hay

Average daily gains of steers fed various types of hay are shown in Table 1. In studies comparing different types of roughages fed to

TABLE 1. DAILY GAINS OF STEERS FED HARVESTED HAY

Type	Form fed[a]	Daily gain, kg	References
Alfalfa			
	P/Gd-dehy[b]	1.06	Dinius et al., 1978
	P/Gd-hay[b]	1.01	Dinius et al., 1978
	Pellet[c]	.88	Dinius et al., 1975
	Ground-dehy.	.71	Dinius et al., 1975
		.59	Baird et al., 1958
		.19	Baird et al., 1958
Bermudagrass			
	Pellet	.69	Utley et al., 1978
	Pellet	.87	Utley et al., 1978
	Greenchop	.37	Hart et al., 1976
		.67	Hart et al., 1976
	Pellet	.80	Hart et al., 1976
	Pellet	.91	Beaty et al., 1969
		.24	McCormick et al., 1967
		.33	Baird et al., 1958
		.12	Baird et al., 1958
Other			
Bahiagrass	Pellet	.79	Utley et al., 1978
Orchardgrass	Ground[c]	.56	Dinius et al., 1978
Clover-timothy	Pellet	.92	Dinius et al., 1975
Alfalfa-brome		.56	El Serafy et al., 1974
Bahiagrass		.50	McCormick et al., 1967
Bahiagrass	Pellet	.84	Beaty et al., 1969
Timothy-fescue		.59	Forbes and Irwin, 1968
Ryegrass	Chopped-dry	.88	Kay et al., 1971
Lespedeza		.13	Baird et al., 1958
Peanut hay		.37	Baird et al., 1958
Soybean hay		.34	Baird et al., 1958
Oat hay		.52	Baird, et al., 1958
Lespedeza		.15	Baird et al., 1958
Lespedeza		.15	Baird et al., 1958

[a]Dry-cured hay, unless otherwise specified.

[b]P/Gd = Pelleted and/or ground; Daily gain reflects mean of pelleted and ground dehy or hay fed treatments.

[c]Sun-cured processed hay.

steers, alfalfa hay has generally produced the best overall average daily gains. In studies conducted by Dinius et al. (1978) chopped and pelleted dehydrated alfalfa and hay produced steer average daily gains of 1.06 and 1.01 kg, respectively, whereas average daily gains of only .56 kg were obtained with ground orchardgrass. Baird et al. (1958) reported average daily gains of .59, .13, .33, .37, .34 and .52 kg for stockers fed alfalfa, Sericea lespedeza, Coastal bermudagrass, peanut, soybean and oat hays, respectively. In a similar study Baird et al. (1958) obtained average daily gains of .19, .15, .12 and .15 kg from stockers fed alfalfa, Kobe lespedeza, Coastal bermudagrass and Sericea lespedeza, respectively.

Dinius et al. (1975), however, obtained superior steer performance from a roughage source other than alfalfa. Average daily gains of .92, .88 and .71 kg were obtained from steers fed pelleted clover-timothy, pelleted alfalfa hay and ground dehydrated alfalfa hay, respectively.

Another roughage which shows potential as a feed for stocker cattle is bermudagrass hay. Although bermudagrass loses quality rather rapidly with advancing maturity, crude protein levels above 12% and digestibilities around 60% can be expected with proper management. Using the chemical composition data of McCroskey et al. (1968) for Midland bermudagrass, the "index of availability" of VanSoest and Moore (1965), and the regression equation (Auburn University; Forage Testing Program) to estimate the TDN and digestible protein content of May and June harvested bermudagrass, average daily gains of approximately .68 kg for 200 kg calves fed high-quality bermudagrass hay appear possible.

Utley et al. (1978) harvested Coastal bermudagrass , Coastcross-1 bermudagrass and Pensacola bahiagrass at 4- and 8-week intervals.

In vitro dry matter digestibilities and crude protein concentrations averaged 61.34% and 16.68% at the 4-week interval and 52.78% and 12.4% at the 8-week harvest interval, respectively. Steer average daily gains (Table 1) for the Coastal bermudagrass, Coastcross-1 bermudagrass and bahiagrass were .69, .87 and .79 kg, respectively. All forage, however, was dehydrated and pelleted, thereby possibly enhancing intake.

In studies conducted by Hart et al. (1976) Coastal bermudagrass was fed to steers as greenchop, cured hay and pellets. Average daily gains were .37, .67 and .80 kg, respectively. Beaty et al. (1969) reported average daily gains of .91 and .84 kg of steers fed pelleted Coastal bermudagrass and Pensacola bahiagrass, respectively. However, in studies conducted by McCormick et al. (1967) average daily gains were greater (.50 vs .24 kg) for steers fed Pensacola bahiagrass.

Baird et al. (1958) also found bermudagrass hay inferior to most other hays as a roughage for growing stocker steers (Table 1). However, the quality of hay as effected by stage of maturity at harvest may have greatly influenced average daily gains.

Other harvested hays that have produced excellent steer gains as reported by El Serafy et al. (1974), Forbes and Irwin (1968) and Kay et al. (1971) are shown in Table 1.

Overseeded Bermudagrass Pastures

Seeding annual forages into perennial sod provides an opportunity to extend the normal grazing season as well as increase forage and livestock production. In studies conducted by McMurphy and Tucker (1974), steers began grazing rye and wheat overseeded into bermudagrass in February. Harris et al. (1972) obtained 40 to 50 more grazing days and

560 kg extra beef gain per hectare by overseeding vetch or rye into Coastal bermudagrass.

Steer gains per hectare were nearly doubled and the grazing season was extended 3 months in studies conducted by Hoveland et al. (1978) in which Coastal bermudagrass was overseeded with rye and clover.

Utley et al. (1976) compared gains of steers grazed on cool-season annual forage (ryegrass and oats) on prepared seedbeds or overseeded into bermudagrass pastures. Gains were .07 kg per day greater (1.12 versus 1.05) for steers grazed on the overseeded pastures. However, twice as much total steer gain and nearly twice as much forage was produced per hectare on prepared seedbeds during the period from December to April. Utley et al. (1977) concluded that overseeding pastures in October reduced the grazing season 30 to 45 days when compared to prepared seedbed pastures, which are normally seeded earlier. L. I. Croy (personal communication) stated that, in order to obtain adequate winter stands of small grains overseeded in bermudagrass pastures, seeding must be done at later dates to avoid bermudagrass competition for nutrients. For this reason fall and winter grazing of overseeded bermudagrass has generally been very limited to date.

Bermudagrass Pastures

Good stocker gains are obtainable from bermudagrass pastures. Production data for stocker cattle grazed on Coastal bermudagrass at the North Louisiana Hill Farm Experiment Station from 1971 to 1976 show ranges in average daily gain, stocking rate and total gain per hectare of .26 to .88 kg, 3.5 to 12.4 head per hectare and 233 to 990 kg per hectare, respectively. The overall average daily gain was .79 kg. Oliver (1973) obtained average daily gains of .68 kg from stocker

steers during a 148-day period beginning in April.

Utley (1976) reported average daily steer gains of .64 and .72 kg and total gain per hectare of 553 and 598 kg from Coastal and Coastcross-1 bermudagrass pastures, respectively.

Although forage quality and forage intake decline during the later part of the bermudagrass growing season (Telford et al., 1974; Wilson et al., 1977), with intensive management some of these problems may be overcome. In a six-year study conducted by Oliver (1978), Coastal bermudagrass pastures were stocked with yearlings and spring-weaned calves at rates of 3.5 to 12.4 head per hectare. Increased levels of fertility were required with increasing stocking rates. Total gains of yearlings and spring-weaned calves increased with increasing stocking rates, in a linear fashion from 430 to 991 kg per hectare and 233 to 834 kg per hectare, respectively.

For proper bermudagrass pasture utilization in stocker programs, it is recommended to begin grazing when forage is 2 to 3 inches tall, use a stocking rate of 7.4 to 12.4 head per hectare and remove any surplus matured forage (Oliver et al., 1978).

Carcass Compositional Changes in Stocker Cattle

Guenther et al. (1965) found that lean to fat ratios declined with steer maturity, and that steers fed on different planes of nutrition to the same weights tended to produce similar total gains of fat and lean.

In studies conducted by Lofgreen et al. (1963), heifers fed alfalfa hay at maintenance, intermediate and ad libitum levels displayed changes in percent empty body fat and protein of .3 and 0.0, 2.9 and -0.1, and

6.8 and -0.3, respectively. The maintenance group showed an empty body and protein loss of 5.9 and 1.1 kg, respectively, while fat content was increased by .05 kg. In this study the specific gravity technique was used to estimate empty body fat and protein which ranged from 10.9 to 17.7% and 18.9 to 19.2%, respectively.

Hull et al. (1969), also using the specific gravity technique, predicted a range in percent carcass fat and protein of 19.3 to 22.6 and 16.8 to 17.6, respectively for steers grazing at varying frequencies on irrigated orchardgrass, ryegrass, and clover pastures. They reported that the amount of protein gain per day was related to protein intake since carcass protein content decreased with decreasing protein intake. However, regression analysis was not conducted to further examine the relationship. They further reported that differences in body fat gain due to treatment were not as great as differences in body protein gain. They speculated that this may have been due to some of the fat gain being broken down to meet other body requirements when protein intake is inadequate.

In contrast, the loss of protein while gaining fat which was reported by Lofgreen et al. (1963) for cattle receiving a maintenance ration, was also reported by Hull et al. (1969).

Although the aforementioned speculation and observations may be real, the specific gravity technique may be incapable of accurately determining carcass composition in the type of cattle used in these studies. In the study reported by Hull et al. (1969) the average empty body weight of the initial slaughter group was approximately 250 kg which is well below the average empty body weight of steers used by Garrett and Hinman (1969) of 325 $\pm$ 57.0 kg to derive the body composition

equations used by Hull et al. (1969).

In the study reported by Lofgreen et al. (1963), in which the empty body composition of steers was around 10% fat, specific gravity techniques may have also failed to accurately predict carcass composition. It should be noted that in the study by Garrett and Hinman (1969) it was found that the percent fat in the empty body was similar to the percent fat in the carcass.

Garrett and Hinman (1969) and Gil et al. (1970) indicated that specific gravity is less accurate than physical separation in estimating composition in carcasses containing less than 12% fat. In studies conducted by Kelly et al. (1968) specific gravities were determined on the edible portion (lean plus fat) of carcasses. They obtained the highest correlations between density and composition when steer carcasses contained over 40% fat, but found when fat made up less than 20% of the carcass specific gravity was not high correlated to composition. At this level of fat composition the correlation coefficients for fat and protein were -.20 and .16 ($P>.05$), respectively.

Compensatory Gain

Compensatory gain has been defined by Wilson and Osburn (1960) as the ability of an animal, previously restricted in growth, to resume growth at a rate greater than that normal for animals of the same age. Peacock et al. (1964) and Nichols and Lesperance (1975) reported greater than normal spring and summer daily gains from cattle gaining less than .35 kg per day during the previous winter.

Lake et al. (1974b) and Coleman et al. (1976), on the other hand, reported that no compensatory gain was seen in cattle previously gaining

greater than .38 kg per day. Although daily gains of .38 kg may be too great to develop cattle which will exhibit compensatory gains, the exact daily gain under which compensatory gain potential is developed in cattle is not clear. According to Wilson and Osbourn (1960) compensatory gain depends on several factors. Among these are the degree or severity and duration of undernutrition, the stage of development of the body at the commencement of undernutrition, and the pattern of re-alimentation.

Cattle exhibiting compensatory gain will display greater than normal feed intakes during re-alimentation (Meyer and Clawson, 1964; Meyer et al., 1965; Fox et al., 1972). Upon refeeding, they fail to attain the same final weight as contemporary cattle fed normally (Fox et al., 1972; Horton and Holmes, 1978). Animals exhibiting compensatory growth deposit more protein and less fat during the early period of re-alimentation, but deposit relatively more fat during the latter part of the feeding period (Meyer et al., 1965; Fox et al., 1972; Dockerty et al., 1973).

Increased efficiency of protein and energy utilization during the full feeding period is largely responsible for compensatory gains (Meyer and Clawson, 1964; Fox et al., 1972; Asplund et al., 1975). Actual digestibility of feedstuffs may be unaffected (Horton and Holmes, 1978; Asplund et al., 1975).

Grain on Grass

In recent years feeding grain on grass has been extensively studied. Berry et al. (1975) described advantages and disadvantages of utilizing more grass and less grain in finishing programs. As producers begin

to utilize grass-grain systems in finishing cattle, specific questions, as follows, concerning the various systems available must be addressed:

1. What is the rate of substitution of grain for grass in grass-grain systems?

2. What is the effect of forage quality on grain intake?

3. To what extent can stocking rates be increased by feeding grain on grass?

4. Should cattle be ad libitum or limit-fed grain?

5. Should complete rations or grain alone be fed?

6. What is the efficiency of grain utilization in grass-grain production systems?

Rate of Substitution of Grain for Grass in Grass-Grain Systems

Forbes et al. (1966), Forbes et al. (1967) and Tayler and Wilkinson (1972) reported a linear decrease in grass dry matter intake with increased dry matter intakes of barley or barley-protein supplement mixtures. However, the decline in intake of grass was less than the consumption of barley, which resulted in an overall increase in total dry matter intake. The rate of decline in grass intake ranged from .6 to 1.02 kg per kg of barley fed. Reasons why total dry matter intake was increased with grain feeding was not fully discussed by any of the above authors. However, Tayler and Wilkinson (1972) observed that gut fill was substantially reduced as the level of concentrate in the diet increased, indicating that a faster rate of passage existed with concentrate feeding, thereby, allowing for greater intakes.

In another study, Blaxter and Wilson (1963) fed concentrates to sheep, and found that at low levels of concentrate intake (one-third of total intake) the decline in hay intake was greatest for the highest quality hay and was equal to the amount of concentrate consumed. Lake (1974a) also reported a decrease in grass (fresh forage) consumption, approximately equal to the intake of grains in studies utilizing irrigated pastures.

It would appear that with high-quality forages the decline in grass consumption approaches the amount of grain consumed. Whereas, with forages of lower quality, the rate of decline is less than the amount of grain consumed.

Effect of Forage Quality on Grain Intake

High-Quality Forage. Lowrey et al. (1976a), Lowrey et al. (1976b) and McCampbell et al. (1976) reported grain consumption averaging around 3.6 kg per head per day for steers which grazed rye, wheat and/or ryegrass winter pastures. Utley and McCormick (1976) reported grain consumption of 5.9 kg per head per day by steers fed corn and grain sorghum on rye pastures. Clanton (1977) reported corn consumption as high as 7.36 kg per head per day by steers that grazed irrigated pastures; whereas Spooner and Ray (1978) reported grain consumption of over 9 kg per head per day on high-quality bermudagrass-clover and fescue-clover pastures. Spooner and Ray (1978) concluded that a key to feeding grain on pasture is to make maximum use of forage when it is highest in quality and that utilizing pastures of poorer quality will be reflected in decreased average daily gains.

Elder (1967) reported that, even though good small grains forage was always available for stockers, daily grain consumption was high (4.5 kg) during some months of the grazing period, but were noted to be very low during the month of April when gains were high.

The above data are inconclusive regarding anticipated levels of grain intake when feeding grain ad libitum on high-quality pastures. Many unknown factors may be involved in determining the level of grain intake. The physiological status of the plant, type of grain or grain mixture fed and individual animal preferences are but a few of these factors.

Moderate- to Low-Quality Forage. The previous section which describes the substitution rate of grain for grass also describes the general pattern seen when increasing levels of grain are fed on moderate- to low-quality pastures. In general, forage intake decreased with increasing grain intakes. Godbey et al. (1959) reported similar trends (increased grain intake and decreased forage intake) when forage palatability deteriorated.

Anticipated levels of grain intake, particularly on moderate- to low-quality grass, may be as high as 75% of the total dry matter intake and 85% of the intake seen in drylot cattle (Tayler and Wilkinson, 1972).

The Extent Which Stocking Rates Can Be Changed by Feeding Grain on Grass

Lowrey et al. (1976a), Lowrey et al. (1976b), McCampbell et al. (1976) and Utley and McCormick (1976) fed grain ad libitum to steers on small grains pastures and were able to double stocking rates over

non grain-fed groups. Gulbransen (1976) reported near linear increases in grain consumption from 2.9 to 6.5 kg per head per day with successive increases in stocking rates from 2.5 to 12.5 head per hectare. In studies conducted by Mott et al. (1968) carrying capacities were increased by 75% and total beef production per hectare was more than doubled by feeding grain ad libitum on grass.

In general, when feeding grain on grass with moderate stocking rates, forage intake is not influenced by stocking rate (Tayler and Wilkinson, 1972). But, under ad libitum feeding conditions stocking rates may need to be increased to very high levels (>10 head per hectare) to insure maximum forage utilization. Under limit-feeding conditions stocking rates will vary and need to be adjusted according to the rate of substitution of grain for grass.

Ad Libitum Grain Feeding on Grass

Grain consumption of cattle fed ad libitum on grass, as discussed earlier, has been extremely variable, particularly if the forage quality is very high. However, daily gains have generally been less than drylot ad libitum-fed steers (Roark et al., 1966; Utley and McCormick, 1976; Schupp et al., 1976). Carcasses of cattle finished on grain-grass systems tend to grade lower and display traces of yellow fat while having a higher cutability (less fat) than carcasses of feedlot fed cattle (Berry et al., 1975).

Clanton (1977) concluded that full feeding cattle on pasture did not take less grain or lower the cost of gains unless it was associated with less labor, less protein supplement or less overhead; and,

therefore, had little advantage over full feeding cattle in drylot. However, others (McClaugherty et al., 1975; Utley and McCormick, 1975; Spooner and Ray, 1977) comparing drylot and/or grass only systems to grain-grass systems reported optimal performance and/or returns for steers self-fed grain on grass.

From several experiments where the response to feeding grain on grass had been small and uneconomical, Tayler and Wilkinson (1972) surmised that, due to low stocking rates, cattle always had more forage available than they could eat. Therefore, the amount of grass replaced by grain increased (forage utilization decreased) as forage quality decreased. By adjusting stocker rates so that comparable sward status was maintained for non-fed, limit-fed and full-fed treatment groups, Mott et al. (1968) and Gulbransen (1975) obtained optimum steer gains per head and per hectare from full-fed groups. By maintaining pastures of the highest quality forage, such as done in these studies, Spooner and Ray (1978) reported average daily gains from steers fed grain on fescue-clover pastures that were greater than average daily gains of drylot fed cattle (1.42 vs. 1.37 kg).

Limited Grain Feeding on Grass

Lake et al. (1974b), Coleman et al. (1976) and Embry (1976) obtained linear increases in average daily gains with each increment increase in grain fed to cattle. Coleman et al. (1976) and Denham (1977) reported that the first increment of supplementation gave the greatest response in daily gains, with each additional increment yielding smaller increases in daily gain.

Lake et al. (1974b) found that daily gains of steers supplemented above 1.82 kg of corn per head per day on irrigated pastures were not increased, and suggested that 1.82 kg of corn may be near the maximum amount of supplemental energy justifiable. Embry (1976) arrived at similar conclusions from studies in which corn was fed to heifers on alfalfa-grass pastures. While these studies were conducted with pastures containing relatively high-quality forage, when forage quality is limited greater amounts of supplemental energy may be warranted.

Complete Rations Versus Feeding Only Grain on Grass

Roark et al. (1966) fed a mixed ration of corn and cottonseed meal to steers in drylot and to steers grazing wheat and rye pastures and obtained average daily gains of 1.06, .97 and .91 kg from full-fed (drylot), grass-grain fed and non grain-fed groups, respectively.

In studies conducted by Coleman et al. (1975) average daily gains of steers grazing St. Augustine grass were increased from .37 to .67 kg per head per day when a supplement of corn, citrus pulp, cottonseed meal and minerals was fed from 0 to 4.5 kg per head per day. Tayler and Wilkinson (1972) produced empty body weight average daily gains on ryegrass pastures nearly identical to drylot gains (1.36 vs. 1.38 kg for period 1 and 1.26 and 1.29 kg for period 2) with a concentrate mixture of barley, fish meal, soybean meal, molasses, minerals and vitamins.

Most studies conducted relative to feeding grain on grass utilized grain only. Godbey et al. (1959) reported no significant differences in daily gains of steers on grass fed corn, milo, barley and wheat,

individually or in mixtures. Utley and McCormick (1976) obtained similar average daily gains on grass supplemented with corn or grain sorghum.

Although, many other studies have been conducted where only grain was fed on grass, Lake et al. (1974b), limit-fed corn to steers on irrigated pastures of orchardgrass, bromegrass and alfalfa mixtures and reported improved forage nitrogen utilization over non-corn fed groups but determined that an imbalance of protein and energy existed which may have prevented maximum animal performance. Clanton (1977), on the other hand, reported a decrease in animal performance due to lack of protein and/or calcium, when feeding corn ad libitum on irrigated pastures.

From these studies, it would appear that under limit grain feeding conditions, deficiencies in energy prevented maximum animal performance, although this deficiency would decline with increased levels of grain.

Under ad libitum grain feeding conditions a protein and/or mineral deficiency may exist. Therefore, complete rations formulated according to expected levels of forage intake and possible deficiencies would provide for both increased gains and better forage utilization.

Efficiency of Grain Utilization on Grass

Feed efficiencies (kg of grain per kg of gain) of cattle fed grain on grass have been calculated by several methods. Embry (1976) reported efficiencies of 2.6, 4.7 and 6.4 from corn intakes of 1.75, 3.44 and 6.3 kg (full-fed), respectively, by steers on alfalfa-grass pastures. Spooner and Ray (1978) reported feed efficiencies from 5.5

to 8.0 for steers fed grain on bermudagrass-clover pastures. In these studies, calculated feed efficiencies attribute total weight gain to grain consumption and fail to account for the contribution of forage to beef weight gain. Efficiencies calculated by this method are over-estimated and will approach zero at low levels of grain intake.

Denham (1977) reported feed efficiency as kg of grain per kg of increased gain over non grain-fed (grass only) controls. This method greatly under-estimates feed efficiency, since it fails to take into account the reduction in forage consumption due to grain intake.

Elder (1967) and Elder and Tucker (1968) utilized the previously reported method to calculate feed efficiency, but also assessed the increase in carrying capacity afforded by feeding grain on pasture. This was measured in terms of steer grazing days per hectare. Feed efficiency was then determined by dividing the total grain consumed per hectare by the increase in beef gain per hectare. Assuming equal grazing pressure in both grain-fed and non-fed groups, the amount of grain fed per hectare would accurately account for the increase in beef gain per hectare due to feeding grain on pasture.

With this method of computing efficiency, Elder and Tucker (1968) reported conversion rates of 8.7 kg of grain per kg of increased gain per hectare for steers limit-fed corn or grain sorghum on small grain pastures and limit-fed on Common bermudagrass pastures. Stocking rates had been increased by approximately 25% per hectare.

Mott et al. (1968) utilizing the put and take method to maintain uniform sward status, regressed total grain fed per steer on total gain per steer, grain fed per hectare on steer days per hectare, and grain fed per hectare on total gain per hectare. The highest correlation ($r=.997$)

was obtained by regressing grain fed per hectare on total gain per hectare.

Feed efficiencies calculated as grain fed per steer per day divided by gain per steer per day ranged from 2.6 to 6.3 for the ten pasture-grain treatment combinations of this study. Feed efficiencies calculated as grain fed per steer per day divided by the increase in daily gain due to grain ranged from 7.6 to 9.7. Feed efficiencies calculated as grain fed per hectare divided by the increase in gain per hectare over the non-fed treatment ranged from 6.7 to 7.4. In all methods of calculating feed efficiency, the best (lowest value) efficiency was obtained with steers receiving the lowest levels of grain. Also, the quantity of grain required for each kg of gain increased with successive increments of grain.

Although these methods of calculating feed efficiency display the same trend, calculating efficiency by dividing grain fed per hectare by the increase in gain per hectare (Elder and Tucker, 1963; Mott et al., 1968) provides the most accurate estimate of feed efficiency and allows estimates of the contributions of grain and forage to beef weight gains to be made.

By knowing the contributions of forage and grain to beef weight gains, a more accurate evaluation of the grain-grass system is obtained. Because many studies have not been designed to partition these contributions, a poor assessment of the grain-grass production system under study has often been obtained.

CHAPTER III

CATTLE PERFORMANCE AND ECONOMIC POTENTIALS OF ALTERNATIVE STOCKER AND FINISHING PROGRAMS FOR FALL-WEANED CALVES

Summary

Studies were conducted over a two-year period to compare live and carcass weight gains and feed efficiencies of fall-weaned calves (1) placed directly in the feedlot or (2) carried as stockers on wheat pasture or bermudagrass hay before being finished by feeding grain on small grains-interseeded bermudagrass (SG/B) pastures or by ad libitum feeding in the feedlot. Steers from each of the two stocker programs were also grazed to heavier weights on SG/B pastures for approximately 60 days before being finished in the feedlot.

Live and carcass weight gains of steers grazed on wheat pasture were .85 and .56 kg per day, respectively, in the first year and .52 and .41 kg per day, respectively, in the second year. Live weight gains of steers fed bermudagrass hay were 0 and .18 kg per day for the first and second years, respectively, whereas, carcass weight gains were -.08 and .07 kg per day, respectively. During the finishing phase, steers previously fed bermudagrass hay clearly exhibited compensatory gains in the first year of the study. However, in the second year compensatory gains were not as apparent, since steers from

the wheat pasture stocker program initially out gained steers that had previously been fed bermudagrass hay during the stocker phase. In both years, feed consumption of steers finished by feeding grain on pasture was high; approximately 80 percent of that of paired feedlot, ad libitum-fed groups. The contribution of forage to weight gains of steers fed grain on grass was minimal. Of all steers finished in the feedlot, daily gains of steers initially placed in the feedlot were the lowest; however, feed efficiencies were better for the initial feedlot steers.

Enterprise budgets were developed for each production system. In general, grazing steers for 60 days on SG/B pastures or throughout the summer on SG/B pastures resulted in the greatest returns and in most cases paid all production costs and residual return to the producer. Returns of steers stockered on bermudagrass hay and subsequent finishing systems were less than those of similar systems where steers grazed wheat pasture during the stocker phase.

Retaining ownership of stocker cattle through the feedlot after grazing wheat pasture and/or spring SG/B pastures did not add to returns. Break-even analysis of the all-forage production systems indicated that non-feed costs are consistently greater than feed (primarily pasture and hay) costs. Mean break-even average daily gains of steers from the all-forage production systems for a producer who must pay all operating, capital, ownership and labor costs were .68 and .39 kg in the first year and .69 and .52 kg in the second year for steers of the wheat pasture and bermudagrass hay production systems, respectively. For the producer who has excess hay, pasture, machinery and equipment, and labor, mean break-even average daily gains were .39

and .22 kg in the first year and .41 and .30 kg in the second year for steers from the wheat pasture and bermudagrass hay stocker programs, respectively.

Introduction

In an effort to obtain greater returns to apply against increasing cow maintenance costs, cow-calf producers may elect to retain ownership of their weaned calves through the stocker and possibly feedlot phase of production. If sound economic decisions are to be made specific questions relative to alternative beef production systems must be addressed. Cattle performance on optional stocker programs and its effect on subsequent feedlot performance are key considerations.

In areas where clean-tilled wheat pasture has traditionally been used to winter fall-weaned calves, grazing costs have been steadily increasing (10 to 15% per year). An alternative stocker program for producers who do not have wheat pasture available to them and do not want to rent wheat pasture would be to retain stocker cattle on bermudagrass pastures and feed bermudagrass hay.

Bermudagrass hay harvested at an early stage of growth will produce substantial steer daily gains (Hart et al., 1976). However, hay harvested at advanced stages of maturity and fed to stocker cattle will limit gains. Producers choosing a production alternative of this nature will recover a portion of the weight and economic loses incurred by the steers on the low plane of nutrition as compensatory gain when the steers are placed on a higher level of nutrition. The extent of this recovery needs to be assessed, however.

Grazing stocker cattle on small grains-interseeded bermudagrass

pastures is another alternative. Although, winter grazing may be limited, derived benefits would be the extension of an existing stocker program.

Finishing cattle by feeding grain on pasture is a frequently suggested alternative beef production system (McClaugherty et al., 1975; Utley and McCormick, 1976; Lowrey et al., 1976a; Lowrey et al., 1976b; McCampbell et al., 1976; Burris et al., 1976; Spooner and Ray, 1977). However, in many studies where grain has been fed to cattle on grass, the experimental design was such that total feed intake per kg of body weight gain could not be partitioned into forage and grain components. Therefore, feed efficiencies (kg feed per kg gain) were not accurately determined.

The objectives of the studies reported herein were to:

1. Compare live and carcass weight gains of fall-weaned steer calves placed (1) directly in the feedlot or (2) on the following two stocker programs.

    A. Grazed on clean-tilled wheat pasture.

    B. Held on dormant bermudagrass pastures and fed bermudagrass hay ad libitum.

2. Compare the performance of steers from the above two stocker programs when grazed to heavier weights on small grains-interseeded bermudagrass pastures before being finished in feedlot.

3. Determine the relative energy contributions from forage and grain to weight gains of steers fed grain ad libitum on small grains-interseeded bermudagrass pastures.

4. Develop enterprise budgets for each beef production system.

Experimental Procedure

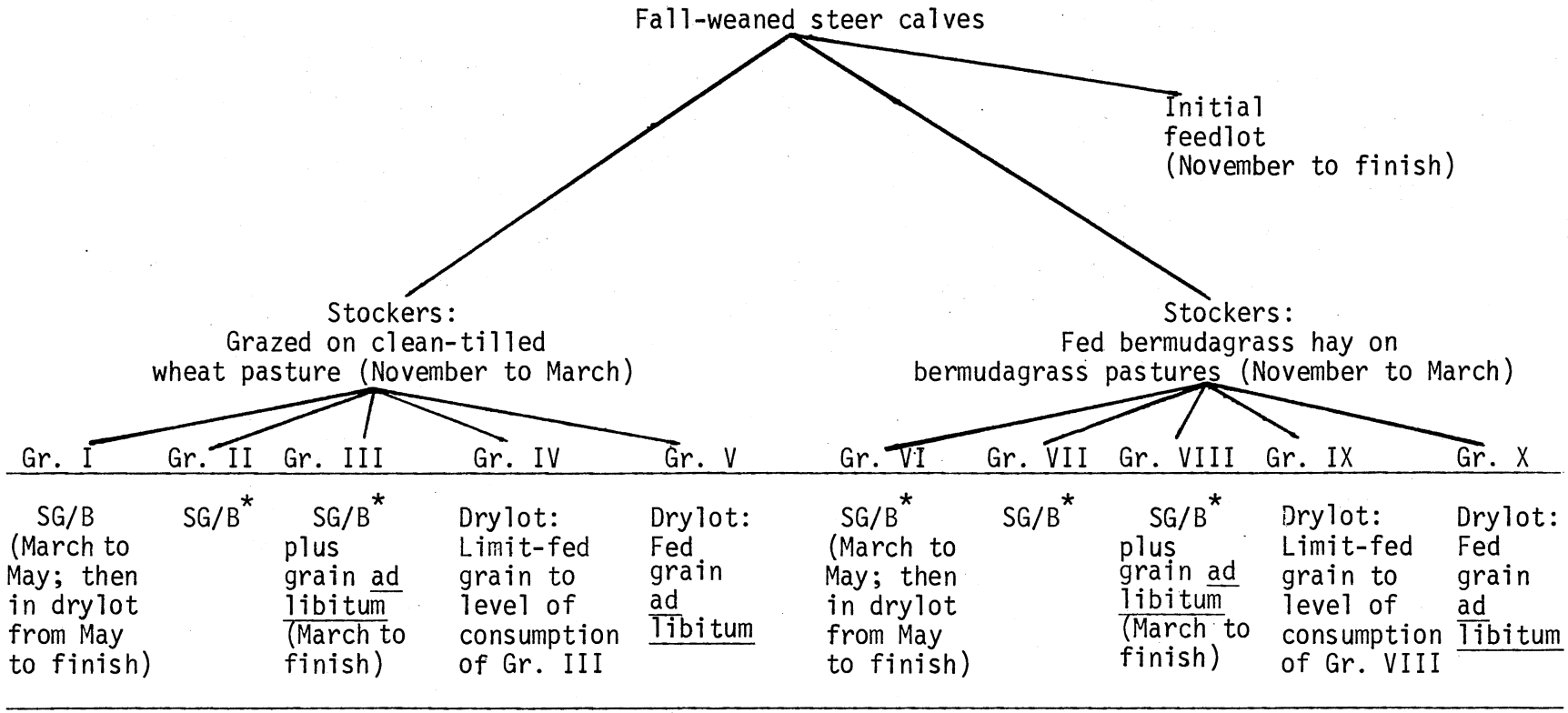
The studies were conducted over a two-year period; similar experimental procedures were utilized each year.

Cattle

One-hundred and thirty-one (131; 1976-77) and 113 (1977-78) fall-weaned Hereford X Angus steer calves were purchased through an order buyer. After being carried through a receiving program of about 3 weeks, during which the calves grazed native tall grass pastures, the calves were randomly allotted to the treatment groups shown in Figure 1.

Initial Feedlot Group

In the first year 6 pens of steers (2 steers/pen) were placed in the feedlot and fed from November 16, 1976 to April 28, 1977 (163 days). In the second year 4 pens of steers (3 steers/pen) were placed in the feedlot from November 9, 1977 to May 22, 1978 (194 days). The steers were fed ad libitum a finishing ration of whole shelled corn, cottonseed hulls, and supplement. The ration contained 40 percent cottonseed hulls initially, and corn was substituted for hulls at a rate of about 1 percent per day until the steers were on a ration of 87 percent whole shelled corn, 5 percent cottonseed hulls, and 8 percent supplement. The supplement contained 60 percent crude protein on an as-fed basis and contained: (%) soybean meal, 70.3; urea, 10.1; calcium carbonate, 7.5; salt, 4.5; wheat middlings, 3.5; potassium chloride, 3.3; trace minerals, .4; vitamin A (30,000 IU/g), .3; Aurofac 50, .1.



*SG/B = Small grains-interseeded bermudagrass pastures.

Figure 1. Steer treatment groups

Stocker Phase

One-hundred and twelve (112) of the remaining steers in the first year and 94 of the remaining steers in the second year were allotted to 2 groups and placed on either (1) wheat pasture or (2) a dormant bermudagrass pasture and fed bermudagrass hay ad libitum, from November 17, 1976 to March 16, 1977, the first year, and November 9, 1977 to March 29, 1978, the second year. Core samples of about one-third of the bales of hay fed were taken weekly for crude protein and in vitro dry matter digestibility (IVDMD) determinations. A mineral mix consisting of 64% dicalcium phosphate, 31% trace-mineralized salt, and 5% cottonseed meal was fed free-choice to each group of steers. Due to the poor quality of hay, the steers on bermudagrass pasture were fed .90 kg of cottonseed cake per head per day for the last 20 days of the stocker phase in the first year.

Initial (7 steers) and intermittent slaughter groups (4 steers/stocker group) were killed at the Oklahoma State University Meat Laboratory immediately prior to and after the stocker phase so that carcass weight gains and changes in carcass composition could be measured. Carcass density was determined on the right side of each carcass (Garrett and Hinman, 1969). The right sides were then physically separated into fat, lean and bone. The weight of these components were multiplied by 2 to obtain estimates of total carcass fat, lean and bone. Brungardt and Bray (1963) have shown that there were essentially no differences in carcass fat, lean and bone content of right and left sides of beef carcasses.

The quantity of fat-free lean was determined for each carcass from the separable lean portion. Grinding, mixing and sampling

procedures for ether extract determinations were as follows:

1. The grinder,[1] mixer,[2] and mixing pans were placed in the cooler with the separable lean at least 12 hours prior to sampling.

2. The lean was ground through a coarse plate (hole diameter = .95 cm) followed by manual mixing in a pan then mechanical mixing for a period of approximately two minutes.

3. The lean was then ground through a fine plate (.32 cm) followed by mechanical mixing.

4. The lean was ground again with the fine plate in the grinder.

5. As the lean was ground the last time, 9 grab samples were taken. These samples were taken so as to be evenly distributed, random samples of the entire carcass.

6. The 9 grab samples were randomly allotted into three sub-samples and were manually mixed.

7. From each of these sub-samples, approximately 50 g of the ground lean was placed in a properly labeled plastic Whirl-Pac bag. The samples were then frozen until analyzed for total lipid.

8. In preparation for total lipid determination, the samples were thawed at 4 C and then homogenized at 20 C using a Sorvell Omnimixer.

9. A 5 g aliquot was taken from each sub-sample and the total lipid content determined using the Goldfisch apparatus and modified

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[1]Model No. 6642; The Biro Mfg. Co.; Marblehead, Ohio.

[2]Model No. 100DA, Leland Food Mixer; Leland Detroit Mfg. Co.; Detroit, Michigan.

A.O.A.C. (1970) procedures. The modification consisted of deletion of fine sand to the lean sample prior to the drying and extraction process.

One or more total lipid determinations were made for at least two of the three-sub-samples. If more than one determination was made on a single sample, the determinations were averaged and a single value was assigned to that sub-sample. The mean percent ether extract of the analyzed samples was used to estimate the amount of fat in the separable lean of the carcasses. Fat-free lean was determined by substracting the fat content from the total separable lean.

Finishing Phase

At the end of the stocker phase 50 steers (1976-77) and 40 steers (1977-78) within each of the two stocker groups were randomly assigned to 5 treatment groups I-V or VI-X (Figure 1). Each treatment group consisted of 2 pens of 5 steers per pen in the first year and 4 steers per pen in the second year. Steers were fed on their respective treatment groups until it was judged their carcasses would grade low-choice, at which time they were killed at a commercial packing plant. Groups I and VI were grazed to heavier weights on SG/B pastures for approximately 60 days before being finished in the feedlot. Groups III and VIII were grazed on SG/B pastures and fed ad libitum rations that contained 13.5 percent or 15 percent crude protein (DM basis), respectively. The rations initially contained 40 percent cottonseed hulls, coarsely ground corn (1 1/2 inch screen), soybean meal, and 5 percent of a mineral-vitamin carrier supplement. The level of cotton-seed hulls in the rations was decreased (corn increased) at a rate of 10 percent per week until the rations contained 15 percent hulls. The

final composition of the 13.5 percent crude protein ration was 68.6 percent ground corn, 15 percent hulls, 11.4 percent soybean meal and 5 percent carrier supplement. The crude protein level of the rations was decreased from 15 to 13.5 percent when steers that were fed bermudagrass hay during the stocker phase weighed about 295 kg. Steers that were stockered on wheat pasture were fed the 13.5 percent crude protein ration throughout the finishing phase.

Each of the 2 pens of steers in treatment groups III and VIII were assigned "paired" groups of steers that were (1) grazed on SG/B pastures and fed nothing but the mineral mix utilized in the stocker phase (treatment groups II and VII), (2) placed in drylot and limit-fed (groups IV and IX), or (3) fed ad libitum in drylot (groups V and X) the same rations that groups III and VIII were fed on SG/B pastures. Drylot groups IV and IX were limit-fed daily the same amount of ration that their paired group on SG/B consumed. The amount of ration fed daily to the drylot, limit-fed groups was adjusted weekly. Additional "put-and-take" steers were used in the SG/B pastures that Group II and VII steers grazed in order to fully utilize the available forage.

As each pen of steers from group III and VIII were killed, the respective paired pen of steers from groups IV and IX were also killed and shrunk weights of steers from the respective paired steer groups II and VII were measured. Feed efficiency for all grain fed groups was calculated as kg feed dry matter intake and as Mcal of metabolizable energy (ME) per kg of weight gain. Ration ME values were calculated from published NRC values for all feedstuffs.

Steers of groups II and VII, and III and VIII were rotated among 2 sets of 4 pastures, at 2-week intervals. The size of each pasture

was approximately 2 ha. Individual pasture forage yields were estimated from forage production (clipped to a height of 2.54 cm) under stationary cages (1 per pasture). Crude protein and *in vitro* dry matter digestibility (IVDMD) was determined from clippings of available forage outside cages. Forage yield and quality is shown in Appendix A, Tables 17 (1977) and 18 (1978).

Since put-and-take steers were not used in pastures grazed by steers in groups III and VIII and since forage utilization by steers in these pastures was less than that by steers of groups II and VII, the excess forage was removed as hay. When hay was harvested only one-half of each pasture was mowed at a time; the remaining one-half was mowed one to two weeks later.

The SG/B pastures were seeded with 56 kg Triumph wheat and 56 kg Bonel rye per ha during the third week of September, prior to beginning the study each year. The pastures were seeded with a John Deere Powr-Till Seeder. Fifty-six kg of nitrogen were applied per hectare in early October and again in February.

All steer weights used to calculate live weight gains were taken after over-night shrinks (usually about 16 hr) without feed and water.

Statistical Analysis

Data from the stocker phase were analyzed by analysis of variance procedures for a completely randomized design. Data from the post-stocker phase of the studies were analyzed by analysis of variance procedures for a factorial arrangement of treatments within a completely random design.

Statistical analysis of performance data pooled, within treatment groups, across years indicated treatment X year interactions ($P<.05$) existed. For this reason, separate analyses were conducted for data of each year and treatment comparisons were made within years. The probable cause of the interactions was due to differences in weather conditions and quality of hay fed during the stocker phase of both years. The manner in which these factors influenced steer performance is discussed in the following section.

Differences among treatment means were tested for statistical significance by use of the LSD when the F test for treatment differences was significant ($P<.05$).

Results and Discussion

Stocker Phase

Weight gains of steers during the stocker phase of both years are shown in Table 2. Live and carcass average daily gains of steers grazed on wheat pasture were greater ($P<.05$) than those of steers fed bermudagrass hay during the winter in both years. Live weight gains of steers grazed on wheat pasture were .33 kg per day (.52 vs .85) lower in the second year of the study. In that year, bermudagrass hay was fed to steers on wheat pasture for a total of 29 days, due to snow and/or ice cover. This would partially account for the decreased gains. The increased daily gains observed for steers fed bermudagrass hay the second year is attributed to the improved quality of hay which was 3.73 percentage units higher in crude protein (11.58 vs 7.85) and 5.57 percentage units higher in IVDMD (42.97 vs 37.40) than the hay fed during the first year of this study.

TABLE 2. PERFORMANCE OF STEERS DURING STOCKER PHASE

Year:	1976-77		1977-78	
Stocker group:	Wheat pasture	Bermudagrass[a] hay	Wheat pasture	Bermudagrass[a] hay
No. steers	57	55	47	47
Initial live wt., kg	188[b]	202[c]	216	218
Final live wt., kg	289[b]	202[c]	289[b]	243[c]
ADG (live), kg	.85[b]	.00[c]	.52[b]	.18[c]
ADG (carcass), kg	.56[b]	-.08[c]	.41[b]	.07[c]

[a]Mean ± SEM percent crude protein and IVDMD of bermudagrass hay were 7.85 ± .31 and 37.40 ± .51 for 1976-77 and 11.58 ± .41 and 42.97 ± 1.09 for 1977-78, respectively.

[b,c]Means within a year with different lettered superscripts are statistically different ($P<.05$).

Initial and final carcass composition of steers in the stocker phase is shown in Table 3. In general during the stocker phase the percent fat-free lean in the steer carcasses decreased in the first year but increased in the second year for both stocker programs. The percent total fat, as determined from the physical separation technique, in the carcasses increased for steers stockered on wheat pasture, but decreased in carcasses of steers fed bermudagrass hay.

Estimates of carcass fat using the specific gravity technique were consistently less than those determined by physical separation. The apparent differences in carcass fat between the two methods ranged from .35 to 7.77%. In this study, the percent carcass fat of most steers

TABLE 3. CARCASS COMPOSITION[a] OF STEERS IN STOCKER PHASE

Year:	1976-77		1977-78	
Stocker group:	Wheat pasture	Bermudagrass hay	Wheat pasture	Bermudagrass hay
Initial carcass data				
Carcass wt., kg	96.9	104.1	106.4	107.9
Fat free lean, %[b]	62.94	62.94	59.77	59.77
Separable bone, %[b]	20.74	20.74	20.82	20.82
Total fat, %[b]	16.32	16.32	19.41	19.41
Total fat, %[c]	15.97	15.97	14.27	14.27
Final carcass data				
Carcass wt., kg	163.2	94.5	163.3	118.0
Fat free lean, %[b]	55.27	61.86	61.22	67.88
Separable bone, %[b]	16.97	24.71	18.70	22.15
Total fat, %[b]	27.76	13.43	20.08	9.97
Total fat, %[c]	20.84	9.01	12.31	7.71

[a] Statistical analysis of data not conducted.

[b] Determined from physical separation technique; adjusted for the amount of ether extract in lean.

[c] Determined from specific gravity technique (Garrett and Hinman, 1969).

was above 12, the percent below which Garrett and Hinman (1969) indicated body composition estimations by specific gravity are less accurate, however, the carcass weight of these steers was less than 216.5 $\pm$ 41.6 kg, which was the average weight of steers used by Garrett and Hinman (1969) to derive the equations for estimating carcass composition. It would appear different equations are needed to estimate body composition from specific gravity measurements of cattle with light carcasses.

Changes in carcass composition [(final weight of carcass component $\div$ initial weight of carcass component) X 100] of steers during the stocker phase are shown in Table 4. The dressing percent of stocker steers fed bermudagrass hay decreased 4.78 (51.64 vs 46.86) percentage units in the first and .92 (49.39 vs 48.47) percentage units the second year. This decrease in dressing percent would partially be attributed to the increase in gut fill and less carcass gain. Consumption of bermudagrass hay, as determined from the total amount of hay fed, was high (i.e., approximately 2.7 and 3.2 percent of body weight for the first and second years, respectively). These estimates do not, however, take into account hay wastage around feeders.

The percent change in fat-free lean (147.88, 1976-77; 157.15, 1977-78) and separable bone (137.83, 1976-77; 137.82, 1977-78) was similar in both years for steers grazed on wheat pasture. However, in the first year where daily gains of steers were higher than those of the second year the percent change in fat, as determined by physical separation techniques, was also higher (286.53 vs 158.71). This would indicate that differences in weight gain of the wheat pasture steers for the two years were largely due to differences in gain of fat.

TABLE 4. CHANGES IN CARCASS COMPOSITION[a] OF STEERS DURING STOCKER PHASE

Year:	1976-77		1977-78	
Stocker group:	Wheat pasture	Bermudagrass hay	Wheat pasture	Bermudagrass hay
Initial dressing %	51.64	51.64	49.39	49.39
Final dressing %	56.44	46.86	56.53	48.47
Fat free lean, kg[b]	29.20	- 7.07	36.36	15.62
Fat free lean, %[bc]	147.88	89.21	157.15	124.23
Separable bone, kg[b]	7.61	1.75	8.38	3.68
Separable bone, %[bc]	137.83	108.11	137.82	116.39
Total fat[b]				
Kilograms	29.49	- 4.3	12.13	- 9.17
Percent[c]	286.53	74.69	158.71	56.19
Total fat[d]				
Kilograms	18.53	- 8.11	4.91	- 6.29
Percent[c]	219.35	51.21	132.24	59.09

[a]Statistical analysis of data not conducted.

[b]Determined from physical separation technique; adjusted for the amount of ether extract in lean.

[c](Final weight of carcass component ÷ initial weight of carcass component) X 100.

[d]Determined from specific gravity technique (Garrett and Hinman, 1969).

The percent change in fat-free lean of steers stockered on bermudagrass hay was 89.21 (1976-77) and 124.33 (1977-78). In both years the percent change in separable bone was greater than 100 (108.11, 1976-77; 116.39, 1977-78), indicating structural growth did occur. However, loss of fat, as determined by physical separation techniques, was evident in both years, being 4.3 and 9.17 kg, respectively, for the first and second year. The loss of fat while gaining lean, as observed by steers stockered on bermudagrass hay in the second year, was also reported by Lofgreen et al. (1963) and Hull et al. (1969) and was speculated as being due to the breakdown of fat to meet other body requirements when protein intake is inadequate.

Finishing Phase

Live weight gains and feed efficiencies (feedlot only) of steers grazed to heavier weights on SG/B pastures for 56 days (1976-77) and 63 days (1977-78) after the stocker phase before being finished in the feedlot are shown in Table 5. During the first year average daily gains (ADG) of steers fed bermudagrass hay during the stocker phase were greater than ADG of wheat pasture steers during the 56 days on SG/B pastures (1.00 vs .77 kg) and while in the feedlot (1.60 vs 1.49 kg). The increased gains and improved feed efficiencies observed for steers fed bermudagrass hay during the stocker phase are characteristic of compensatory growth.

In situations where steers of similar type and condition such as those at the beginning of this study are carried through stocker programs which effect large differences in gains and fleshiness, it would be anticipated that steers held on the lower plane of nutrition

TABLE 5. PERFORMANCE OF STEERS FROM TWO PREVIOUS STOCKER PROGRAMS WHEN GRAZED ON SMALL GRAINS-INTERSEEDED BERMUDAGRASS PASTURES AND THEN FINISHED IN THE FEEDLOT

Year:	1976-77		1977-78	
Stocker phase:	Wheat pasture	Bermudagrass hay	Wheat pasture	Bermudagrass hay
Initial wt., kg	290[a]	203[b]	291[a]	245[b]
Final wt., kg	449[a]	429[b]	477	463
ADG (live), kg				
SG/B[c]	.77[a]	1.00[b]	1.08[a]	.83[b]
Feedlot	1.49	1.60	1.37	1.42
SG/B and feedlot	1.18[a]	1.40[b]	1.25	1.21
Feed/gain[d]	6.64	6.49	8.21	7.53

[a,b]Means within a year with different lettered superscripts are statistically different ($P<.05$).

[c]While grazing small grains-interseeded bermudagrass pastures (56 days, 1976-77; 63 days, 1977-78).

[d]Kilograms feed dry matter per kilogram of gain in the feedlot.

would make compensatory gains during the post-stocker finishing phase.

This phenomena, however, was not observed in the second year. Steers stockered on wheat pasture continued to out gain (1.08 vs .83 kg/day) the bermudagrass hay fed stocker steers during the subsequent 63 days on SG/B pastures. Daily gains in the feedlot were similar, however (1.37 kg, wheat pasture steers; 1.42 kg, bermudagrass hay fed steers), but feed efficiencies in feedlot of steers fed bermudagrass hay during the stocker phase (7.53 vs 8.21 kg DM feed/kg gain) tended to be improved.

Reasons why steers fed bermudagrass hay during the stocker phase of the second year of the study did not clearly exhibit signs of compensatory gains during the finishing phase are that differences in daily gains (.85 kg, 1976-77; .34 kg, 1977-78) and final carcass fat content (14.33%, 1976-77; 10.11%, 1977-78) between steers from the different stocker groups were less the second year. The differences observed in the second year, therefore, may not have been great enough for compensatory gains by steers that were initially placed on the lower plane of nutrition to be apparent.

Performance of steers during the finishing phase is shown in Tables 6 and 7 for the first and second years, respectively. Daily gains of steers grazed on SG/B pastures and fed nothing were .57 and .77 kg (1976-77) and .79 and .69 kg (1977-78), respectively, for steers from the wheat pasture and bermudagrass hay stocker programs. Although, these gains were determined from steer weights measured at the time that their paired groups (III and VIII) were killed, ADG of steers grazing SG/B pastures the entire summer were .44 kg (wheat pasture) and .79 kg (bermudagrass hay) in the first year and .66 kg

TABLE 6. PERFORMANCE OF STEERS DURING FINISHING PHASE (1976-77)

Stocker phase:	Wheat pasture					Bermudagrass hay					Least significant difference
Group No.:	I[a]	II	III	IV	V	VI[a]	VII	VIII	IX	X	
Initial wt., kg	290^{c}	293^{c}	290^{c}	290^{c}	289^{c}	203^{b}	202^{b}	206^{b}	203^{b}	198^{b}	7.9
Final wt., kg	449^{d}	355^{b}	404^{c}	426^{cd}	415^{c}	429^{cd}	327^{b}	406^{c}	418^{cd}	429^{cd}	31.0
Hot carcass wt., kg	279^{c}		251^{b}	261^{bc}	260^{bc}	252^{b}		243^{b}	243^{b}	255^{b}	23.5
Days fed in feedlot	78	0	0	108	92	107	0	0	163	154	
Total days in finishing phase	134	108	108	108	92	163	163	163	163	154	
ADG (live), kg	1.19^{cd}	.57^{b}	1.07^{c}	1.26^{cd}	1.36^{de}	1.40^{e}	.77^{b}	1.23^{cd}	1.33^{de}	1.51^{e}	.20
ADG (carcass), kg	.86^{b}		.82^{b}	.91^{bc}	1.05^{c}	.96^{bc}		.90^{bc}	.91^{bc}	1.06^{c}	.18
Feed DM intake, kg	9.87^{ef}		8.38^{bc}	8.71^{cd}	10.72^{f}	10.38^{ef}		7.70^{b}	7.61^{b}	9.39^{de}	1.00
Feed/gain (live)[g]	6.64^{bc}		7.87^{d}	6.98^{cd}	7.86^{d}	6.49^{bc}		6.25^{bc}	5.74^{b}	6.29^{bc}	.96
Feed/gain (carcass)[g]			10.28^{d}	9.59^{bcd}	10.21^{cd}			8.51^{b}	8.36^{b}	8.93^{bc}	1.31
Mcal/gain (live)[h]	18.83^{bc}		22.31^{d}	19.79^{cd}	22.24^{d}	18.47^{bc}		17.96^{bc}	16.48^{b}	17.93^{bc}	2.67
Mcal/gain (carcass)[h]			29.14^{c}	27.21^{bc}	28.90^{c}			24.47^{b}	23.99^{b}	25.46^{bc}	3.71

[a]Average daily gains were determined from total weight gains obtained during the grazing and feedlot periods; feed intake and efficiencies were calculated from data obtained from the feedlot period only.

^{bcdef}Means with different lettered superscripts are statistically different ($P<.05$).

[g]Kilograms feed dry matter per kilogram of gain.

[h]Mcal metabolizable energy per kilogram of gain.

TABLE 7. PERFORMANCE OF STEERS DURING FINISHING PHASE (1977-78)

Stocker phase:	Wheat pasture					Bermudagrass hay					Least significant difference
Group No.:	I[a]	II	III	IV	V	VI[a]	VII	VIII	IX	X	
Initial wt., kg	291[c]	287[c]	285[c]	292[c]	290[c]	245[b]	242[b]	247[b]	243[b]	243[b]	7.2
Final wt., kg	477[e]	373[b]	424[c]	435[cd]	438[cd]	463[de]	356[b]	452[cde]	439[cd]	455[de]	28.8
Hot carcass wt., kg	303[e]		262[b]	264[bc]	274[bcd]	278[bcd]		282[cd]	273[bcd]	289[de]	19.1
Days fed in feedlot	85	0	0	108	89	117	0	0	166	148	
Total days in finishing phase	148	108	108	108	89	180	166	166	166	148	
ADG (live), kg	1.25[cd]	.79[b]	1.31[cd]	1.32[cd]	1.66[e]	1.21[c]	.69[b]	1.24[cd]	1.18[c]	1.44[d]	.20
ADG (carcass), kg	.93[b]		.94[b]	.93[b]	1.23[c]	.89[b]		.98[b]	.94[b]	1.16[c]	.13
Feed DM intake, kg	11.27[c]		9.23[b]	9.30[b]	11.61[c]	10.65[c]		8.98[b]	8.86[b]	11.08[c]	1.32
Feed/gain (live)[f]	8.21		7.09	7.02	7.00	7.53		7.27	7.54	7.73	.99
Feed/gain (carcass)[f]			9.79	10.05	9.41			9.17	9.47	9.57	1.03
Mcal/gain (live)[g]	23.38		20.19	20.05	19.94	21.55		20.95	21.74	22.17	2.82
Mcal/gain (carcass)[g]			27.91	28.72	26.81			26.40	27.33	27.45	2.95

[a]Average daily gains were determined from total weight gains obtained during the grazing and feedlot periods; feed intake and efficiencies were calculated from data obtained from the feedlot period only.

[bcde]Means with different lettered superscripts are statistically different ($P<.05$).

[f]Kilograms feed dry matter per kilogram of gain.

[g]Mcal metabolizable energy per kilogram of gain.

(wheat pasture) and .69 kg (bermudagrass hay) in the second year. Total steer grazing days per ha, calculated through the third week of September, were 468 and 354 in the first and second years, respectively. Steer grazing days per ha on SG/B pastures are shown in Appendix A, Table 19, within each year, for each month of the grazing season.

Carcass ADG of steers placed directly in the feedlot after the stocker phase (groups V and X) were similar the first year (1.05 vs 1.06 kg). In the second year of the study carcass ADG were more variable (1.23 vs 1.16 kg) but not significantly different ($P>.05$). Daily feed dry matter intakes was greater ($P<.05$) for steers stockered on wheat pasture in the first year (10.72 vs 9.39 kg) but not significantly greater ($P>.05$) the second year, being 11.61 kg for steers stockered on wheat pasture and 11.08 kg for steers stockered on bermudagrass hay.

Feed (kg) and Mcal of ME required per kg of carcass gain were not significantly different ($P>.05$) between steers of each stocker group within each year.

Feed consumption of steers fed grain on pasture (groups III and VIII) was high (i.e., approximately 80% of the feed consumption of their paired feedlot ad libitum fed groups). The relationship between carcass ADG and feed dry matter intake of limit-fed and ad libitum-fed steers in feedlot that were paired to steers fed grain on SG/B pastures, was used to partition the contribution of grain and forage to carcass weight gains of steers fed grain on pasture. From this relationship and the grain consumption of steers on pasture, the portion of carcass ADG due to grain intake could be

estimated. Observed carcass ADG above the calculated amount would be the portion contributed by forage. Conversely, from the observed carcass ADG of steers fed grain on grass, the grain sparing effect of the forage could be determined.

The observed, calculated and differences between the observed and calculated carcass ADG and feed dry matter intakes are shown in Table 8 for each replicate of steers fed grain on grass. In the first year observed carcass ADG were generally slightly less than calculated carcass ADG, whereas, in the second year they were slightly greater. The magnitude of these differences are very small, however. Carcass ADG of steers fed grain on grass were 90% (wheat pasture) and 99% (bermudagrass hay) of carcass ADG of their paired feedlot limit-fed groups in the first year and 101% (wheat pasture) and 104% (bermudagrass hay) in the second year (Tables 6 and 7). The contribution of forage to weight gains of steers fed grain on SG/B pastures was, therefore, minimal.

Carcass characteristics of steers from the different finishing programs for the first year of the study are shown in Table 9. In general, steers from the various finishing programs that were fed bermudagrass hay during the stocker phase had lower dressing percentages, greater fat thicknesses, smaller rib-eye areas and higher yield grades compared with steers grazed on wheat pasture during the stocker phase. Expressing fat thickness and rib-eye area on a per 100 kg of hot carcass weight basis did not change the relative relationship between the finished steers of the two stocker groups.

Carcass characteristics of steers from the second year of the study are shown in Table 10. As in the first year of the study,

TABLE 8. ESTIMATED CONTRIBUTION OF FORAGE AND GRAIN TO CARCASS GAINS OF STEERS FED GRAIN ON GRASS

Year:	1976-77				1977-78			
Stocker phase:	Wheat pasture		Bermudagrass hay		Wheat pasture		Bermudagrass hay	
Replication:	1	2	1	2	1	2	1	2
Observed carcass ADG, kg	.83	.80	.92	.89	.86	1.03	.94	1.02
Observed feed DM intake, kg/hd/day	8.70	8.07	8.02	7.38	8.64	9.82	8.39	9.58
Calculated carcass ADG for[a] observed feed intake, kg	.88	.91	.95	.88	.86	.98	.95	.97
Calculated feed DM intake[a] for observed carcass ADG, kg/hd/day	8.12	5.03	7.79	7.58	8.65	10.18	8.29	9.93
Observed minus calculated carcass ADG, kg[a]	-.05	-.11	-.03	.01	.0	.05	-.01	.05
Observed minus calculated feed DM intake, kg	.52	3.04	.23	-.20	-.01	-.36	.10	-.35

[a]Determined from the linear relationship between carcass ADG and feed DM intake of the limit-fed and ad libitum-fed steers in the feedlot that were paired to the respective grain on grass replicate.

TABLE 9. STEER CARCASS CHARACTERISTICS (1976-77)

Stocker phase:	Wheat pasture				Bermudagrass hay				Least significant difference
Group No.:	I	III	IV	V	VI	VIII	IX	X	
Dressing %	62.18[c]	62.07[c]	61.34[bc]	62.68[c]	58.63[a]	59.93[ab]	58.09[a]	59.48[ab]	2.05
Fat thickness,[e] cm	2.12[ab]	1.98[a]	2.00[a]	2.19[ab]	2.48[bc]	2.45[bc]	2.34[abc]	2.74[c]	.41
Fat thickness/100 kg carcass,[e] cm	.76[a]	.79[a]	.77[a]	.84[ab]	.99[c]	1.01[c]	.96[bc]	1.07[c]	.12
REA, sq. cm	80.16[d]	69.48[bc]	75.46[cd]	73.70[cd]	65.21[ab]	61.65[a]	64.72[ab]	62.86[ab]	6.94
REA/100 kg carcass, sq. cm	28.98[c]	27.95[bc]	29.03[c]	28.36[bc]	25.91[ab]	25.44[a]	26.77[abc]	24.67[a]	2.52
KHP fat, %	2.90	2.85	3.05	2.95	2.85	3.05	2.95	2.95	.44
KHP fat/100 kg carcass, %	1.04[a]	1.14[ab]	1.17[ab]	1.13[ab]	1.14[ab]	1.26[b]	1.22[b]	1.16[ab]	.15
Yield grade	3.53[a]	3.67[a]	3.53[a]	3.77[a]	4.38[bc]	4.50[bc]	4.21[b]	4.80[c]	.43
Marbling score[f]	14.7	12.7	14.7	14.4	13.2	12.8	12.5	14.2	2.7
Quality grade[g]	10.1	9.4	10.4	10.3	9.7	9.4	9.2	10.0	1.4

[abcd]Means with different lettered superscripts are statistically different ($P<.05$).

[e]Average of three measurements taken 1/4, 1/2 and 3/4 length of the longissimus muscle of the 12 to 13th rib separation.

[f]17 = average modest; 14 = average small; 11 = average slight.

[g]12 = high choice; 10 = low choice; 8 = average good.

TABLE 10. STEER CARCASS CHARACTERISTICS (1977-78)

Stocker phase:	Wheat pasture				Bermudagrass hay				Least significant difference
Group No.:	I	III	IV	V	VI	VIII	IX	X	
Dressing %	63.57[d]	61.76[bc]	60.71[ab]	62.50[cd]	60.09[a]	62.51[cd]	62.19[bcd]	63.51[d]	1.60
Fat thickness,[e] cm	1.88	1.51	1.64	1.57	1.74	1.84	1.77	2.11	.47
Fat thickness/100 kg carcass,[e] cm	.63	.59	.63	.57	.63	.65	.64	.73	.17
REA, sq. cm	75.32[b]	74.29[b]	70.71[ab]	73.14[ab]	68.29[a]	70.41[ab]	68.15[a]	71.39[ab]	5.74
REA/100 kg carcass, sq. cm	25.09[ab]	28.37[c]	26.80[bc]	26.83[bc]	24.58[a]	25.02[ab]	25.11[ab]	24.71[ab]	2.13
KHP fat, %	2.31	2.63	2.38	2.63	2.38	2.88	2.88	2.19	.51
KHP fat/100 kg carcass, %	.77[a]	1.00[bc]	.90[abc]	.96[bc]	.86[ab]	1.02[c]	1.05[c]	.76[a]	.15
Yield grade	3.62[ab]	3.02[a]	3.30[ab]	3.24[ab]	3.63[ab]	3.75[b]	3.73[ab]	3.90[b]	.71
Marbling score[f]	14.1[abc]	11.8[a]	12.4[a]	12.4[a]	15.0[bc]	12.6[ab]	15.8[c]	15.3[bc]	2.7
Quality grade[g]	10.0[ab]	8.6[a]	9.1[ab]	9.0[ab]	10.5[b]	9.3[ab]	10.4[b]	10.5[b]	1.6

[abcd]Means with different lettered superscripts are statistically different ($P<.05$).

[e]Average of three measurements taken 1/4, 1/2 and 3/4 length of the longissimus muscle of the 12 to 13th rib separation.

[f]17 = average modest; 14 = average small; 11 = average slight.

[g]12 = high choice; 10 = low choice; 8 = average good.

steers stockered on wheat pasture had greater rib-eye areas and lower yield grades. However, dressing percentage tended to average about same for steers from both stocker groups, while marbling scores of carcasses were higher for steers from the bermudagrass hay stocker program. Total days in the feedlot were less for steers from the wheat pasture stocker phase, however. Expressing fat thickness and rib-eye area on a per 100 kg of hot carcass weight basis, tended to show an advantage for steers from the wheat pasture program.

In both years steers from the wheat pasture stocker program and in the first year steers from the bermudagrass hay stocker program that were fed grain on grass had carcasses with lower marbling scores and carcass quality grades than carcasses of steers from their paired feedlot, limit-fed groups. Since these paired groups of steers were fed similar amounts of feed, efficiency of feed utilization was apparently poorer for the steers fed grain on grass when compared with their paired limit-fed groups.

Negative associative effects of the ration fed and the consumed forage could account for this decrease in efficiency of feed utilization. However, an increased maintenance requirement for the steers fed grain on grass could also influence efficiency of feed utilization. Kromann et al. (1960) indicated that the energy requirements of steers grazing on grass were not increased over those of steers in confinement. However, others (Blaxter, 1969; Ledger, 1977; Ribeiro et al., 1977) have shown that maintenance energy requirements of cattle grazing on grass are 4 to 97% greater than the maintenance energy requirements of cattle in confinement. The amount of increase was dependent on walking distance which ranged from 1 to 15 km in the

above studies.

Five steers (1976-77) and 8 steers (1977-78) that were stockered on wheat pasture and then grazed on SG/B pastures through the summer were slaughtered the last week in September of both years of the study. Carcass quality grade was between low- and average-good the first year and average- and high-good the second year.

Performance and carcass data of steers that were initially placed in the feedlot (November 16, 1976) versus that of steers stockered on wheat pasture or bermudagrass hay prior to being finished by feeding ad libitum in feedlot (groups V and X) the first year are shown in Table 11. Carcass average daily gains (feedlot only) of steers initially placed in the feedlot were lower ($P<.05$) than those of either group of steers that were carried through as stockers before being finished in the feedlot. Feed and Mcal of ME required per kg of gain were lower, although not significantly ($P>.05$), for steers initially placed in the feedlot. The average slaughter weight of 234 kg and carcass quality grade of slightly under low-choice indicate that the initial feedlot steers should have been fed a little longer. In general, the carcass characteristics of steers stockered on wheat pasture before being finished in the feedlot were more desirable; whereas carcass characteristics of steers fed bermudagrass hay during the stocker phase and the initial feedlot steers were similar.

Performance and carcass data of the ad libitum fed feedlot groups of the second year are shown in Table 12.

Live and carcass average daily gains of steers initially placed in the drylot were lower ($P<.05$) than those of either group of steers

TABLE 11. PERFORMANCE OF INITIAL FEEDLOT STEERS VERSUS STEERS STOCKERED ON WHEAT PASTURE AND BERMUDAGRASS HAY BEFORE BEING FINISHED IN FEEDLOT (1976-77)

Group:	Initial feedlot	Wheat pasture	Bermudagrass hay
Initial weight, kg	187	289*	198
Final weight, kg	393	415	429*
Days in stocker program	0	119	119
Days in feedlot	163	92	154
Total days	163	211	273
ADG (live), kg	1.26	1.36	1.51*
ADG (carcass), kg	.84	1.05*	1.06*
Feed DM intake, kg	7.17	10.72	9.39
Feed/gain (live)[a]	5.71	7.86	6.29
Feed/gain (carcass)[a]	8.52	10.21	8.93
Mcal/gain (live)[b]	17.36	22.24	17.93
Mcal/gain (carcass)[b]	25.89	28.90	25.46
Hot carcass weight, kg	234	260	255
Dressing percent	59.64	62.68*	59.48
Fat thickness, cm	2.36	2.19	2.74*
Fat thickness/100 kg carcass, cm	1.01	.84*	1.07
REA, sq. cm	62.92	73.70*	62.86
REA/100 kg carcass, sq. cm	26.87	28.36	24.67*
KHP fat, %	3.29	2.95	2.95
KHP fat/100 kg carcass, %	1.41	1.13*	1.16*
Yield grade	4.33	3.77*	4.80*
Marbling score[c]	13.4	14.4	14.2
Quality grade[d]	9.7	10.3*	10.0

*Significantly different from initial feedlot group ($P<.05$).

[a]Kilograms feed dry matter per kilogram of gain.

[b]Mcal metabolizable energy per kilogram of gain.

[c]17 = average modest; 14 = average small; 11 = average slight.

[d]12 = high choice; 10 = low choice; 8 = average good.

TABLE 12. PERFORMANCE OF INITIAL FEEDLOT STEERS VERSUS STEERS STOCKERED ON WHEAT PASTURE AND BERMUDAGRASS HAY BEFORE BEING FINISHED IN FEEDLOT (1977-78)

Group:	Initial feedlot	Wheat pasture	Bermudagrass hay
Initial weight, kg	208	290*	243*
Final weight, kg	427	438	455
Days in stocker program	0	140	140
Days in feedlot	194	89	148
Total days	194	229	288
ADG (live), kg	1.13	1.66*	1.44*
ADG (carcass), kg	.85	1.23*	1.16*
Feed DM intake, kg	7.17	11.61	11.08
Feed/gain (live)[a]	6.37	7.00	7.73
Feed/gain (carcass)[a]	8.47	9.41	9.57
Mcal/gain (live)[b]	19.45	19.94	22.17
Mcal/gain (carcass)[b]	25.89	26.81	27.45
Hot carcass weight, kg	267	274	289
Dressing percent	62.58	62.50	63.51
Fat thickness, cm	2.00	1.57*	2.11
Fat thickness/100 kg carcass, cm	.75	.57*	.73
REA, sq. cm	69.66	73.14	71.39
REA/100 kg carcass, sq. cm	26.04	26.83	24.71
KHP fat, %	3.63	2.63*	2.19*
KHP fat/100 kg carcass, %	1.37	.96*	.76*
Yield Grade	3.98	3.24*	3.90
Marbling score[c]	17.3	12.4*	15.3*
Quality grade[d]	11.3	9.0*	10.5

*Significantly different from initial feedlot group ($P<.05$).

[a]Kilograms feed dry matter per kilogram of gain.

[b]Mcal metabolizable energy per kilogram of gain.

[c]17 = average modest; 14 = average small; 11 = average slight.

[d]12 = high choice; 10 = low choice; 8 = average good.

that were carried through as stockers before being finished in drylot. Feed dry matter consumption of the initial feedlot steers was low for reasons that cannot be explained. However, as seen in the first year, improved feed efficiencies were observed for the initial feedlot steers.

In general, except for marbling score and quality grade, the carcass characteristics of steers stockered on wheat pasture before being finished in the feedlot were the most desirable. Steers initially placed in the feedlot had the smallest rib-eye area. Expressing rib-eye area on a per 100 kg of hot carcass weight basis gave the lowest value for finished steers that were stockered on bermudagrass hay. As in the first year, carcass characteristics of steers fed bermudagrass hay during the stocker phase and the initial feedlot steers were similar.

Enterprise Budget Analysis

The Oklahoma State University Budget Generator was used to analyze the economic potential of the stocker and finishing programs. Each enterprise budget was developed from management and feeding data for steers within the respective treatment groups during this study. In order to eliminate differences in costs not related to treatment, the average initial weight of all steers was adjusted to 193 kg (425 lb) in the first year and 215 kg (475 lb) in the second year. Similarly, the average initial weight of all steers entering the finishing phase was adjusted, within stocker groups, to a common weight. Steer gains and feed efficiencies used in the budgets are nearly identical to the actual observed values, however. One exception is the average daily gains for the 56-day (1976-77) and 63-day (1977-78),

post-stocker period of (1) steers grazed on SG/B prior to being finished in drylot, and (2) steers that remained on pasture all summer were averaged, within the previous stocker treatment groups, since the two treatment groups were managed similarly during the post-stocker period.

Feeder and fed steer prices utilized in the budgets were obtained from general price relationships among grades and weights of steers sold in the fall of 1978 (Ikerd, 1978) and are shown in Table 20 of Appendix A. Adjustments for variation in cattle prices for the months steers were bought and sold were made by multiplying the annual average prices by the 10-year-average ratios (Blakley, 1978), which reflect the seasonal variation in the cattle market during the past 10 years. Operating, machinery and equipment inputs utilized in the budgets were obtained from enterprise budgets prepared by the Oklahoma State University Cooperative Extension Service (1978).

Groups of steers that were slaughtered but failed to grade low-choice were assigned the same selling price as heavy feeders (>900 lb). The enterprise budgets of steer groups II and VII were developed from performance and management data accumulated through the entire summer, rather than from data accumulated to the date when their paired groups (III and VIII) were slaughtered.

The value of hay ($35/ton) removed from the SG/B pastures, and the harvesting costs ($22.50/ton) were assigned to the steers fed grain on grass. The amount of hay added to these production systems for each steer was 2 tons. All pasture charges attributed to each steer were based on animal unit month (AUM) equivalence for the average weight and daily gain of steers for each month of grazing. Conversion

TABLE 13. FORMAT OF ENTERPRISE BUDGET COMPUTER PRINTOUT

WHEAT PASTURE STOCKER TO 646 LB. 119 DAYS
GRAZE OVERSEEDED BERMUDAGRASS 56 DAYS (MAR. 16 - MAY 11)
AD LIB FINISH IN COMMERCIAL FEEDLOT 78 DAYS (MAY 11 - JULY 28, 1977)

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS CHOICE	CWT.	0.98	10.37	57.800	582.05	570.41
TOTAL RECEIPTS						570.41

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
S.G. PASTURE	AUMS	2.88	1.00	2.883	18.00	51.89
BERMUDA HAY	TONS	0.08	1.00	0.080	37.50	3.00
SALT & MIN.	LBS.	11.00	1.00	11.000	0.08	0.88
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
VET & MED.	HD.	1.00	1.00	1.000	2.12	2.12
TRUCKING	CWT.	21.83	1.00	21.830	0.25	5.46
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	1.80	1.00	1.800	14.00	25.20
C.S. HULLS	CWT.	359.67	0.01	3.597	3.25	11.69
CORN	CWT.	1212.19	0.01	12.122	4.29	52.00
S.B. MEAL	CWT.	227.83	0.01	2.278	8.50	19.37
SUPPLEMENT	CWT.	94.73	0.01	0.947	4.29	4.06
FEED MARGIN	DAYS	78.00	1.00	78.000	0.15	11.70
FEEDLOT CHARGE	DAYS	78.00	1.00	78.000	0.05	3.90
MACH. FUEL & LUBE						2.24
MACHINERY REPAIR COST						1.22
EQUIPMENT REPAIR						0.28
TOTAL OPERATING COST						524.29

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	46.12

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	289.564	28.96
MACHINERY INVESTMENT	0.100	8.729	0.87
EQUIPMENT INVESTMENT	0.100	7.050	0.70
TOTAL INTEREST CHARGE			30.53

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	15.59

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	1.46
EQUIPMENT	DOL.	1.60
TOTAL OWNERSHIP COST		3.06

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	12.52

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.440	4.32
EQUIPMENT LABOR	3.000	0.250	0.75
LIVESTOCK LABOR	3.000	1.320	3.96
TOTAL LABOR COST		3.010	9.03

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	3.49

STOCKER ADG 1.86 LB / O.S. BERMUDA ADG 1.88 / FEEDLOT ADG 3.28 LB MADER
OVERSEEDED BERMUDAGRASS ESTABLISHMENT ON CUSTOM BASIS
THESE COSTS ARE PRORATED BY AUM UNITS OVER A 2 MO PERIOD02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 4 MACH. COMP. 12 IND. NUMBER 3 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 7

PROCESSED BY DEPT. OF AGRI. ECON. - OKLAHOMA STATE UNIVERSITY
PROGRAM DEVELOPED BY DEPT. OF. AGRI. ECON. OKLAHOMA STATE UNIVERSITY
DATE PRINTED:02/21/79

TABLE 13 (Continued)

LINE	1 JAN	2 FEB	3 MAR	4 APR	5 MAY	6 JUN	7 JUL	8 AUG	9 SEP	10 OCT	11 NOV	12 DEC	13 PRICE	14 WEIGHT	15 UNIT CODE	16 ITEM CODE	17 TYPE	18 CONT
PRODUCTION					NUMBER OF UNITS													
1 SLTR STRS CHOICE	0.0	0.0	0.0	0.0	0.0	0.0	0.98	0.0	0.0	0.0	0.0	0.0	57.800	10.070	16.	11.	2.	0.
OPERATING INPUTS					RATE/UNIT								PRICE	NUMBER UNITS	UNIT CODE	ITEM CODE	TYPE	CONT
11 STR CALV(4-SICH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	0.0	0.0	74.900	4.250	16.	13.	3.	0.
12 S.G. PASTURE	0.72	0.79	0.43	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.29	0.66	18.000	1.000	10.	153.	3.	0.
13 BERMUDA HAY	0.03	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.02	37.500	1.000	3.	83.	3.	0.
14 SALT & MIN.	1.94	1.75	1.94	1.86	0.69	0.0	0.0	0.0	0.0	0.0	0.88	1.94	0.080	1.000	12.	103.	3.	0.
15 STARTER FEED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.06	0.32	0.0	7.105	1.000	16.	129.	3.	0.
16 NATIVE PASTURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.08	0.20	0.0	5.000	1.000	10.	156.	3.	0.
17 VET & MED.	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.94	0.03	0.01	2.120	1.000	1.	416.	3.	0.
18 TRUCKING	0.0	0.0	0.0	0.0	7.51	0.0	10.37	0.0	0.0	4.25	0.0	0.0	0.250	1.000	16.	481.	3.	0.
19 ORDER BUYER COST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	0.0	0.0	1.000	1.000	1.	469.	3.	0.
20 SALES COMM.	0.0	0.0	0.0	0.0	0.0	0.0	1.00	0.0	0.0	0.0	0.0	0.0	3.000	1.000	1.	405.	3.	0.
21 TAXES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	2.250	1.000	1.	440.	3.	0.
22 O.S. BERMUDA	0.0	0.0	0.45	0.90	0.45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.000	1.000	10.	152.	3.	0.
23 C.S. HULLS	0.0	0.0	0.0	0.0	143.80	111.78	104.09	0.0	0.0	0.0	0.0	0.0	3.250	0.010	16.	104.	3.	0.
24 CORN	0.0	0.0	0.0	0.0	239.87	496.58	475.74	0.0	0.0	0.0	0.0	0.0	4.290	0.010	16.	72.	3.	0.
25 S.B. MEAL	0.0	0.0	0.0	0.0	64.73	83.72	79.38	0.0	0.0	0.0	0.0	0.0	8.500	0.010	16.	119.	3.	0.
26 SUPPLEMENT	0.0	0.0	0.0	0.0	23.60	36.43	34.70	0.0	0.0	0.0	0.0	0.0	4.290	0.010	16.	107.	3.	0.
27 FEED MARGIN	0.0	0.0	0.0	0.0	19.00	30.00	29.00	0.0	0.0	0.0	0.0	0.0	0.150	1.000	9.	201.	3.	0.
28 FEEDLOT CHARGE	0.0	0.0	0.0	0.0	19.00	30.00	29.00	0.0	0.0	0.0	0.0	0.0	0.050	1.000	9.	202.	3.	0.
MACHINERY REQUIREMENTS					HOURS								XXXXX	XXXXX	POWER UNIT	MACH CODE	TYPE	CONT
29 PICKUP	0.16	0.16	0.16	0.16	0.08	0.0	0.0	0.0	0.0	0.16	0.16	0.16	0.0	0.0	11.	11.	4.	0.
EQUIPMENT REQUIREMENTS													NUMBER UNITS	PROPORT OF COST	XXX	EQUIP CODE	TYPE	XXXX
38 MISC													1.000	0.010	0.	6.	5.	0.
39 ELECTRIC FENCE													1.000	0.010	0.	5.	5.	0.
40 WATER TANK													1.000	0.010	0.	23.	5.	0.
41 WORKING CHUTE													1.000	0.010	0.	44.	5.	0.
42 PORTABLE CORRAL													1.000	0.010	0.	45.	5.	0.
43 PORT LOAD CHUTE													1.000	0.010	0.	46.	5.	0.
49 LIVESTOCK LABOR	0.16	0.16	0.16	0.16	0.08	0.0	0.0	0.0	0.0	0.24	0.20	0.16						

MONTHLY SUMMARY OF RECEIPTS AND EXPENDITURES

CATEGORY	YEAR	UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
TOTAL RECEIPTS	1	DOL.	0.0	0.0	0.0	0.0	0.0	0.0	570.41	0.0	0.0	0.0	0.0	0.0	570.41
TOTAL VARIABLE COST	1	DOL.	14.79	15.59	14.62	13.25	33.78	39.65	43.37	0.0	0.0	324.28	9.47	15.47	524.29
ANNUAL CAPITAL	1	DOL.	30.33	31.63	32.85	33.96	36.77	40.08	0.0	0.0	0.0	27.02	27.81	29.10	289.56

LABOR REQUIREMENTS

MACHINERY LABOR	1	HOUR	0.19	0.19	0.19	0.19	0.10	0.0	0.0	0.0	0.0	0.19	0.19	0.19	1.44
LIVESTOCK LABOR	1	HOUR	0.16	0.16	0.16	0.16	0.08	0.0	0.0	0.0	0.0	0.24	0.20	0.16	1.32
EQUIPMENT LABOR	1	HOUR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.0	0.0	0.02	0.02	0.02	0.25
TOTAL LABOR	1	HOUR	0.38	0.38	0.38	0.38	0.20	0.02	0.02	0.0	0.0	0.46	0.42	0.38	3.01

MACHINERY REQUIREMENTS BY MONTH

PICKUP	HOUR	0.16	0.16	0.16	0.16	0.08	0.0	0.0	0.0	0.0	0.16	0.16	0.16		1.20

MACHINERY FIXED AND VARIABLE COST PER HOUR

MACHINE	CODE	DEPR	INSUR.	TAX	TOTAL FIXED	REPAIR	FUEL	LUB.	TOTAL VARIABLE	INT.	HR/TIME
PICKUP	11	1.06	0.04	0.11	1.22	1.01	1.62	0.24	2.88	0.73	1.00

ANNUAL COST SUMMARY FOR EQUIPMENT AND LIVESTOCK

LINE NO.	ITEM	SIZE	UNIT	LIST PRICE	DEPRECIATION	INTEREST	INSURANCE	TAXES	REPAIRS	FUEL AND LUBE	HOURS LABOR	TOT OWNERSHP/YR	TOT OPERATING/YR
6	MISC	0.0		80.00	16.00	4.00	0.24	0.40	3.20	0.0	1.00	16.64	3.20
5	ELECTRIC FENCE	1.00	MILE	150.00	15.00	7.50	0.45	0.75	12.75	0.0	16.00	16.20	12.75
23	WATER TANK	1134.00	GAL.	105.00	10.50	5.25	0.31	0.53	0.0	0.0	2.00	11.34	0.0
44	WORKING CHUTE	1.00		350.00	35.00	17.50	1.05	1.75	3.50	0.0	2.00	37.80	3.50
45	PORTABLE CORRAL	100.00	HD.	575.00	57.50	28.75	1.72	2.88	5.75	0.0	2.00	62.10	5.75
46	PORT LOAD CHUTE	1.00		150.00	15.00	7.50	0.45	0.75	3.00	0.0	2.00	16.20	3.00

ANNUAL CHARGES MADE IN THIS BUDGET FOR EQUIPMENT AND LIVESTOCK

LINE NO.	ITEM	SIZE	UNIT	NUMBER ITEMS	PROPCR. CHARGED	OWNERSHP CHARGES	OPERATING CHARGES	INTERST CHARGES	LABOR HOURS CHARGED
6	MISC	0.0		1.00	0.01	0.17	0.03	0.04	0.01
5	ELECTRIC FENCE	1.00	MILE	1.00	0.01	0.16	0.13	0.07	0.16
23	WATER TANK	1134.00	GAL.	1.00	0.01	0.11	0.0	0.05	0.02
44	WORKING CHUTE	1.00		1.00	0.01	0.38	0.04	0.18	0.02
45	PORTABLE CORRAL	100.00	HD.	1.00	0.01	0.62	0.06	0.29	0.02
46	PORT LOAD CHUTE	1.00		1.00	0.01	0.16	0.03	0.07	0.02

COLUMN NAME OF MACHINE	1 CODE	2 WIDTH (FEET)	3 INITIAL LIST PRICE	4 SPEED (MPH)	5 FIELD EFFIC-ENCY	6 RC1	7 RC2	8 RC3	9 HOURS USED ANNUALLY	10 YEARS OWNED	11 RFV1	12 RFV2	13 PURCHASE PRICE	14 FUEL TYPE	15 HOURS OF LIFE	16 HP
PICKUP	11.	8.5	6750.	20.0	0.88	0.60	0.000631	1.60	500.	8.0	0.600	0.885	5750.	1.	4000.	1.

COLUMN---	1	2	3	4	5	6	7	8	9	10	11
ITEM NAME	CODE	SIZE	UNIT	TYPE	LIST PRICE	PURCHASE PRICE	YEARS LIFE	SALVAGE PROP OF LIST	REPAIR PROP OF LIST	FUEL & LUB PROP	ANNUAL HOURS AS LABOR
ELECTRIC FENCE	5.	1.00	16.	2.00	150.00	150.00	10.00	0.0	0.850	0.0	16.00
MISC	6.	0.0	0.	2.00	80.00	80.00	5.00	0.0	0.200	0.0	1.00
WATER TANK	23.	1134.00	5.	2.00	105.00	105.00	10.00	0.0	0.0	0.0	2.00
WORKING CHUTE	44.	1.00	20.	2.00	350.00	350.00	10.00	0.0	0.100	0.0	2.00
PORTABLE CORRAL	45.	100.00	1.	2.00	575.00	575.00	10.00	0.0	0.100	0.0	2.00
PORT LOAD CHUTE	46.	1.00	20.	2.00	150.00	150.00	10.00	0.0	0.200	0.0	2.00

of steer weight and daily gain to AUM equivalence is shown in Table 21, Appendix A.

The computerized budget program produces the printed format in Table 13, which contains a budget resulting from buying steers in late October and grazing on winter wheat and SG/B for the first year of the study. Finally the cattle were finished in a commercial feedlot to a final weight of 1007 lb (457 kg). The production section tells what was sold from the enterprise, 10.07 cwt adjusted for two percent death loss at a price of $57.80 the choice steer product. Thus, gross receipts were $570.41.

Operating inputs include all cash costs for the production system, except cash outlays of interest and hired labor which are included later. The list reflects the range of inputs included. The next page of the budget shows inputs by months and allows the timing of costs and sales to be studied. Feed inputs are for pasture, hay, starter feed, salt and minerals. The charge for small grains pasture is $18.00 per AUM. This is equivalent to the typical rental charge of $2.25 per cwt of beginning steer weight per month grazed for the winter grazing season. Thus, it covers rental pasture income forgone on the winter wheat. Native pasture used in the receiving program in October is charged at $5.00 per AUM. The charge for SG/B pastures was $14.00 per AUM, and is based on custom rates for preparing, seeding and fertilizing the pasture. The charge for SG/B pastures is similar to the wheat pasture charge ($18.00 per AUM), and thus would be an approximate estimate of the charge of wheat pasture graze-out during the spring. Other costs are for veterinary medical cost, trucking, buying and selling assistance and ad valorem taxes. The major remaining items

include feed consumed in the feedlot and the feed margin and feedlot charges. Amounts and prices for each are indicated in appropriate columns. Machinery and equipment costs are for fuel and maintenance on trucks, pickups and facilities used in the October to July operation (non-feedlot period). Total operating costs plus pasture charges are $524.29.

After operating costs are subtracted from total receipts, $46,12 remains to pay for land, labor, capital, machinery, overhead, risk and management. Successive steps in the budget charge for capital, machinery and equipment ownership costs and labor.

Interest is charged at ten percent on annual and intermediate (machinery and equipment) capital. The annual operating capital for operating inputs totaling $524.29 is only $289.56, when adjusted for the annual equivalent part of a year it is used. The annual interest rate may be the bank borrowing rate or the value of owned capital used in an alternative investment with equal risk. As will be discussed later, interest on machinery and equipment might not need to be considered in making decisions relative to stocker programs if the machinery and equipment are already on hand. That interest is charged as indicated, the residual to land, labor, machinery, overhead, risk and management is $15.59.

The ownership cost section recognizes costs of having machinery and equipment available for the cattle. These capital items depreciate in value and require payment of taxes and insurance. If the producer would have the machinery and equipment whether he has the cattle or not, he might ignore ownership costs in making stockering decisions.

The second page of the budget lists machinery and equipment items assumed used by this stocker enterprise, along with prices and other assumptions affecting costs. Ownership costs total $3.06.

If all labor is hired, labor would cost $9.03. Labor requirements per month for machinery, equipment and direct livestock labor are given on page two of the budget. Machinery labor is for maintaining and operating machines, equipment labor is for equipment and fence maintenance and livestock labor is for checking and working cattle. After the charge for all labor, returns to land, risk and management are $3.49.

After the best estimate of costs and receipts have been determined for a particular production system, managerial interpretation is needed. Different producers can logically make different decisions, based upon their own production resource situation. The following case samples are illustrative of the possibilities.

Case A. A manager who must buy all inputs as described, borrow all money, add or keep machinery and equipment on the farm to handle the stockers, and hire all labor to pursue all phases of the production enterprise in Table 13, would make $3.49 for his risk and management and to help pay his overhead costs of being in the business. He should, however, examine budgets for some of the separate phases to see if any are more profitable to him. For example, he might run stockers on wheat pasture and sell them or run them on small grains-interseeded bermudagrass or graze-out wheat. He might use a farm feedlot or sell the cattle after the stocker phase.

Case B. A manager who has the winter wheat pasture, hay and native pastures borrows annual capital, has machinery and equipment on hand and underused, and has excess labor could earn:

Budgeted return to overhead, risk and management	$ 3.49
Own labor	+ 9.03
Machinery and equipment interest	+ 1.57
Ownership costs	+ 3.06
Winter wheat pasture, hay and native pasture	+56.29
	$73.44

The $73.44 is the return per head for labor, machinery and equipment, hay and pasture, overhead, risk and management. He would pay all other costs including cost of interseeding the bermudagrass pastures and interest on annual capital.

Enterprise budgets developed from each production system for the first and second years of the study are shown in Appendix B and C, respectively. Only the first page of each budget is included.

In this study returns of the alternative beef production systems will be discussed for the two resource cases cited earlier. Enterprise budgets were developed for separate as well as combinations of production phases. Direct economic advantages accrue from multiple phase enterprises, in which cattle are hauled to and started on the farm one time. Thus, hauling, labor, marketing and medical economics are achieved compared to a production chain involving several owners at several locations.

Returns ($/head) of the production systems are shown in Table 14. For producers who must pay all costs (Resource Case A), most of the

TABLE 14. RETURNS ($/HEAD) FROM BEEF PRODUCTION SYSTEMS FOR TWO PRODUCER RESOURCE CASES

Year:					1976-77		1977-78	
Resource Case:					A[a]	B[b]	A[a]	B[b]
Stocker phase: Wheat pasture					$ 23.15	89.44	-31.05	43.50
Finishing system	Spring[c] SG/B	Summer bermudagrass	Grain on grass	Commercial feedlot				
I[d]	X				$ 34.71	104.68	7.47	84.76
I[e]	X			X	3.49[f]	73.44	-54.21	23.08
II	X	X			-13.14	84.07	-49.91	51.59
III			X		-59.72	31.84	-92.34	5.96
V				X	-48.92	18.30	-66.73	7.81
Stocker phase: Bermudagrass hay					$-74.41	-31.30	-72.20	-10.41
Finishing system	Spring[c] SG/B	Summer bermudagrass	Grain on grass	Commercial feedlot				
VI[d]	X				$-30.90	14.94	-40.45	24.07
VI[e]	X			X	-72.48	-26.65	-129.48	-44.80
VII	X	X			13.12	77.43	-39.51	47.23
VIII			X		-122.88	-40.40	-167.96	-67.07
V				X	-88.21	-45.10	-134.48	-72.70
No stocker phase								
Commercial feedlot					$-29.20	-25.21[g]	-54.86	-51.31[g]
Producer-owned feedlot					-39.99	-15.03	-65.28	-38.01

[a]Producer borrows money, rents pasture, hires labor, adds machinery and equipment costs and purchases all other inputs.

[b]Producer has labor, excess machinery and equipment capacity, all pasture and hay. He purchases all other inputs, pays for interseeding bermudagrass pastures, and borrows operating capital.

[c]Small grains-interseeded bermudagrass pasture.

[d]Feeder cattle sold at end of 60-day grazing period on SG/B.

[e]Fed cattle sold at end of feedlot period.

[f]Enterprise budget shown in Table 13.

[g]Difference between resource case A and B is attributed to value of producer carrying cattle through a 3-week receiving period.

systems utilizing wheat pasture during the stocker phase show positive returns. In Resource Case B, when the return to the producers labor, pasture hay and excess machinery and equipment capacity are considered, each system which utilized wheat pasture reflected a positive return. The returns under Case B might be regarded as the amount of money the producer would have for family living, debt repayment and maintenance of his capital stock. The returns are simply the residual return to resources for which no charge has been made. Even though the feedlot shows a positive return, it did not appear to add to the returns achieved from the pasture systems alone.

The returns under Resource Case A are the one the producer should consider if he has other uses for his pasture, labor, machinery and equipment resources. It is assumed that the alternative uses would pay a return equal to the charge for the resources in Case A. Alternative uses are rental and other livestock enterprises such as a larger cow herd.

Table 14 does not paint an optimistic picture of the practice of roughing cattle through the winter on bermudagrass hay, and then moving them to another pasture system or the feedlot. In the first year, performance data of these cattle indicated that compensatory gains result from this wintering program. However, these gains were not great enough to offset the high cost of the wintering program. Returns were positive, however, in the case B situation when steers grazed SG/B pastures for approximately 60-days or through the summer. These all-forage systems along with the stocker program, also, produced the greatest returns for steers of the wheat pasture production systems.

The greatest returns obtained from the wheat pasture production systems were made by steers that grazed SG/B pastures for approximately 60-days after wheat pasture. These returns were $34.71 and $7.47 in the first and second year, respectively, for Case A and $104.68 and $84.76 in the first and second year, respectively, for Case B. The greatest returns obtained from steers that were fed bermudagrass hay during the stocker phase were made by steers that grazed SG/B pastures the entire summer. These steers returned from $32.69 to $108.73 per head more than they did at the end of the stocker phase.

In general, returns were the lowest for steers fed grain ad libitum on SG/B pastures. The extra management and labor required over other production systems and the poor utilization of grass would partially account for the low returns. Also as discussed earlier, steers fed grain on grass had lower ADG and carcass quality grades than paired, feedlot ad libitum-fed groups.

Returns of fall-weaned calves placed in a commercial or producer-owned feedlot were negative. However, when the producer maintained steers in his feedlot and had excess labor (Case B) loses were minimized ($-15.03, 1976-77; -38.01, 1977-78).

Break-even daily gains, selling price ($/cwt) used in calculating the break-even daily gains, non-feed and feed costs of steers of the stocker programs and subsequent grazing intervals on SG/B pastures (all-forage production systems) are shown in Tables 15 and 16 for resource Case A and B, respectively. The non-feed and feed production inputs included in resources Cases A and B are shown in Appendix A, Table 22. In resource Case A mean daily non-feed costs were 1.22- and 1.30-fold greater in the first year and 1.24- and 1.47-fold greater in

TABLE 15. NON-FEED AND FEED COSTS ($/HEAD/DAY) FOR ALL-FORAGE PRODUCTION SYSTEMS, RESOURCE CASE A

Production System	Non-feed[a]	Feed[a]	Total	Selling price[b] $/cwt	Selling price[b] ¢/kg	Break-even ADG, kg
1976-77						
Wheat pasture	.60	.50	1.10	69.50	1.53	.72
SG/B-56 days	.55	.49	1.04	66.40	1.46	.71
SG/B-entire summer	.47	.34	.81	59.30	1.31	.62
Bermudagrass hay	.34	.28	.62	77.90	1.72	.36
SG/B-56 days	.36	.31	.67	75.40	1.66	.40
SG/B-entire summer	.39	.25	.64	68.50	1.51	.42
1977-78						
Wheat pasture	.55	.48	1.03	69.50	1.53	.67
SG/B-63 days	.52	.47	.99	66.40	1.46	.68
SG/B-entire summer	.55	.36	.91	56.40	1.24	.73
Bermudagrass hay	.46	.34	.80	73.50	1.62	.49
SG/B-63 days	.45	.34	.79	70.50	1.56	.51
SG/B-entire summer	.49	.27	.76	61.80	1.36	.57

[a]Production inputs included in non-feed and feed costs are listed in Appendix A, Table 22.

[b]The different selling prices of steers within the same production system of separate years is due to the difference in selling weight.

TABLE 16. NON-FEED AND FEED COSTS ($/HEAD/DAY) FOR ALL-FORAGE PRODUCTION SYSTEMS, RESOURCE CASE B

Production System	Non-feed[a]	Feed[a]	Total	Selling price[b] $/cwt	Selling price[b] ¢/kg	Break-even ADG, kg
1976-77						
Wheat pasture	.51	.03	.54	69.50	1.53	.35
SG/B-56 days	.47	.17	.64	66.40	1.46	.44
SG/B-entire summer	.41	.09	.50	59.30	1.31	.38
Bermudagrass hay	.20	.06	.26	77.90	1.72	.15
SG/B-56 days	.25	.17	.42	75.40	1.66	.25
SG/B-entire summer	.31	.10	.41	68.50	1.51	.27
1977-78						
Wheat pasture	.47	.03	.50	69.50	1.53	.33
SG/B-63 days	.45	.16	.61	66.40	1.46	.42
SG/B-entire summer	.49	.10	.59	56.40	1.24	.48
Bermudagrass hay	.34	.03	.37	73.50	1.62	.23
SG/B-63 days	.35	.12	.47	70.50	1.56	.30
SG/B-entire summer	.41	.08	.49	61.80	1.36	.36

[a]Production inputs included in non-feed and feed costs are listed in Appendix A, Table 22.

[b]The different selling prices of steers within the same production system of separate years is due to the difference in selling weight.

the second year than feed costs for steers of the wheat pasture and bermudagrass hay production systems, respectively. Grazing steers for approximately 60-days on SG/B pastures had little effect on daily non-feed, feed and total costs when compared to the respective wheat pasture or bermudagrass hay stocker programs. However, grazing steers on SG/B pastures for the entire summer greatly decreased daily feed costs and, therefore, tended to reduce total daily cost. Non-feed costs were affected less consistently as compared with the two previous production systems. Mean break-even ADG were .68 and .39 kg in the first year and .69 and .52 kg in the second year for steers of the wheat pasture and bermudagrass hay production systems, respectively.

In resource Case B (Table 16) daily non-feed costs were from 1.5- to 17.0-fold greater than feed costs. Daily non-feed costs increased with each interval of grazing SG/B pastures for steers that were fed bermudagrass hay during the stocker period. In contrast, daily non-feed costs tended to decrease (1976-77) or remain the same (1977-78) with each interval of grazing SG/B pasture for steers from the wheat pasture program. Daily feed costs were the lowest for the stocker production systems, and were the greatest for the SG/B pasture production systems, where pasture interseeding charges were assessed. Mean break-even ADG were .39 and .22 kg in the first year and .41 and .30 kg in the second year for steers of the wheat pasture and bermudagrass hay production systems, respectively. The increase in non-feed costs of the wheat pasture production systems over non-feed costs of the bermudagrass hay production systems is largely attributed to the decline in selling price of the heavier steers, and is reflected in the increased break-even ADG for both resource Cases A and B.

In conclusion returns, averaged across years, of steers during the wheat pasture stocker program were $69.36 ($-3.95 vs $-73.31) greater, in resource Case A, and $46.96 ($66.47 vs $19.51) greater, in Case B, than returns of steers fed bermudagrass hay during the stocker program. Grazing steers on SG/B pastures for approximately 60 days after wheat pasture boasted returns to $21.09 and $94.76 (mean of both years) for resource Case A and B, respectively.

Analysis of costs incurred by steers during the stocker programs indicates that non-feed cost, in resource Case A ranged from $.34 to $.60 per head per day and were 1.15- to 1.35-fold greater than feed costs which ranged from $.28 to $.50 per head per day. In resource Case B non-feed costs, in the stocker program only, ranged from $.20 to $.51 per head per day and were 3.1- to 17.0-fold greater than feed costs which ranged from $.03 to $.09 per head per day.

Mean break-even ADG were high in resource Case A situation, i.e., .70 and .43 kg for steers from the wheat pasture and bermudagrass hay stocker programs, respectively. The greater break-even ADG of steers from the wheat pasture stocker program is partially due to the decline in selling price of the heavier feeder steers. Grazing steers on SG/B pastures for approximately 60-days or through the summer had little effect on non-feed costs, but tended to decrease feed costs in the resource Case A situation. However, in the resource Case B situation both non-feed and feed costs tended to increase by grazing steers on SG/B pastures after the stocker program. Break-even ADG tended to increase with increasing time interval of grazing SG/B pastures under both resource cases.

For the price-weight relationships established in this study, steers in the finishing phase that were carried through the winter on a low plane of nutrition (bermudagrass hay) failed to achieve returns as great as those of steers that were carried through the winter on wheat pasture. Although steers fed bermudagrass hay during the stocker program were less fleshy (lower percent carcass fat) and, in the first year of the study, did exhibit compensatory gains when compared with steers from the wheat pasture stocker program, selling these steers at the end of the stocker phase would require an increase in selling price of $17.51 (case A) and $7.36 (case B) per hundred pounds in the first year and $13.62 (case A) and $1.96 (case B) per hundred pounds in the second year, in order for the producer to break even. Since subsequent gains were not great enough to offset economic losses incurred during the stocker program, economic benefits arising from carrying stocker cattle through the winter on a high plane of nutrition far outweight the economic benefits associated with the subsequent improved performance (compensatory gains) of stocker steers that are carried through the winter on a low plane of nutrition.

LITERATURE CITED

A.O.A.C. 1970. Official Methods of Analysis (11th Ed.). Association of Official Agricultural Chemists. Washington, D.C.

Asplund, J. M., H. B. Hedrick and C. D. Haugebak. 1975. Performance, digestibility and ^{40}K levels in lambs during compensation for feed restriction. J. Anim. Sci. 40: 138.

Baird, D. M., O. E. Sell, and W. S. Hundley. 1958. Comparative value of various roughages for stocker cattle feed. GA. Agr. Exp. Sta. Bull. N. S. 50.

Barr, A. J. and J. H. Goodnight. 1976. Statistical Analysis System. North Carolina State University Press, Raleigh.

Beaty, E. R., John D. Powell and James E. Edwards, Jr. 1969. Forage and animal gains of Coastal bermuda and Pensacola bahia. J. Range Manage. 22: 318.

Berry, Steven L., Reuben Albaugh, Glen R. Ufford, G. M. Spurlock and John R. Dunbar. 1975. More grass and less grain in beef production. Univ. Calif. Div. Agr. Sci. Bull. 1873.

Blakley, L. V. 1978. Livestock and livestock product seasonal prices indexes, 1968-1977. In Oklahoma Current Farm Economics. Okla. Agr. Exp. Sta. Vol. 51 No. 3.

Blaxter, K. L. 1969. The Energy of Metabolism of Ruminants, Chapter 7. London: Hutchinson and Co. Ltd.

Blaxter, K. L. and R. S. Wilson. 1963. The assessment of a crop husbandary technique in terms of animal production. Anim. Prod. 5:27.

Boomer, L. T. 1972. Limit grazing winter pastures with stocker cattle. Symp. on Management of Intensified Winter and Stocker Calves. Samuel Roberts Noble Foundation, Ardmore, Okla.

Clanton, D. C. 1977. Finishing cattle on pasture and other forages: Irrigated pasture. J. Anim. Sci. 44: 908.

Coleman, S. W., F. M. Pate and D. W. Beardsley. 1975. Supplementing steers on pasture. J. Anim. Sci. 40: 181 (Abstr.).

Coleman, S. W., F. M. Pate and D. W. Beardsley. 1976. Effect of level of supplemental energy fed grazing steers on performance during the pasture and subsequent drylot period. J. Anim. Sci. 42: 27.

Corah, L. R., Sarah A. Jackson and A. H. Bishop. 1975. Growth and carcass composition of yearling cattle fattened on combinations of hay, grain and NPN in a feedlot and on grain supplemented pastures. Aust. J. Exp. Agr. 15: 299.

Denham, A. H. 1977. Influence of energy and protein supplements on grazing and feedlot performance of steers. J. Anim. Sci. 45: 1.

Dinius, D. A. 1978. Conserved pasture crops for finishing beef cattle. J. Anim. Sci. 47: 736.

Dinius, D. A., H. K. Goering, R. R. Oltjen and H. R. Cross. 1978. Finishing beef steers on forage diets with additives and supplemental lipid. J. Anim. Sci. 46: 761.

Dinius, D. A., R. R. Oltjen and T. S. Rumsey. 1975. Pelleted forage diets plus supplemental energy and feed additives for finishing beef cattle. J. Anim. Sci. 41: 868.

Dockerty, T. R., V. R. Cahill, H. W. Ockerman, D. G. Fox and R. R. Johnson. 1973. Carcass development in beef cattle subsequent to interrupted growth. J. Anim. Sci. 36: 1057.

Elder, W. C. 1967. Winter grazing small grains in Oklahoma. Okla. Agr. Exp. Sta. Bull. B-654.

Elder, W. C. and B. B. Tucker. 1968. Pasture Management. Okla. Agr. Exp. Sta. Processed Series P-583.

El Serafy, A. M., R. D. Goodrich and J. C. Meiske. 1974. Influence of degree of fermentation on the utilization of energy from alfalfa-brome forage. J. Anim. Sci. 39: 780.

Embry, L. B. 1976. Whole or rolled corn grain fed at various levels to cattle on pasture. 20th Annu. Cattle Feeders Day. South Dakota State University, Brookings.

Forbes, T. J. and J. H. D. Irwin. 1968. The use of barn-dried hay and silage in fattening young beef cattle. J. Brit. Grassland Soc. 23: 299.

Forbes, T. J., A. M. Raven, J. H. D. Irwin and K. L. Robinson. 1967. The utilization of grass fed indoors to young beef cattle, with or without supplementary barley. J. Brit. Grassland Soc. 22: 158.

Forbes, T. J., A. M. Raven and K. L. Robinson. 1966. Observations on the utilization of grass by young beef cattle with and without barley supplementation. J. Brit. Grassland Soc. 21: 167.

Fox, D. G., R. R. Johnson, R. L. Preston, T. R. Docherty and E. W. Klosterman. 1972. Protein and energy utilization during compensatory growth in beef cattle. J. Anim. Sci. 34: 310.

Fox, D. G., R. L. Preston, B. Senft and R. R. Johnson. 1974. Plasma growth hormone levels and thyroid secretion rates during compensatory growth in beef cattle. J. Anim. Sci. 38: 437.

Garrett, W. N. and N. Hinman. 1969. Re-evaluation of the relationship between carcass density and body composition of beef steers. J. Anim. Sci. 28: 1.

Gil, E. A., R. R. Johnson, V. R. Cahill, K. E. McClure and E. W. Klosterman. 1970. An evaluation of carcass specific volume, dye dilution and empty body parameters as predictors of beef carcass composition over a wide range of fatness. J. Anim. Sci. 31: 459.

Godbey, E. G., R. F. Wheeler, D. H. Kropf, W. C. Godley and L. V. Starkey. 1959. Winter forage for fattening steers. South Carolina Agr. Exp. Sta. Bull. 469.

Guenther, J. J., D. H. Bushman, L. S. Pope and R. D. Morrison. 1965. Growth and development of major carcass tissues in beef calves from weaning to slaughter weight, with reference to the effect of plane of nutrition. J. Anim. Sci. 24: 1184.

Gulbransen, B. 1976. Response to supplementary sorghum grain by cattle grazing oats. J. Aust. Exp. Agr. 16: 646.

Harris, R. R., E. M. Evans, J. K. Boseck and W. B. Webster. 1972. Fescue, Orchardgrass and Coastal Bermudagrass grazing for yearling beef steers. Ala. Agr. Exp. Sta. Bull. 432.

Hart, R. H., W. H. Marchant, J. L. Butler, R. E. Hellwig, W. C. McCormick, B. L. Southwell and G. W. Burton. 1976. Steer gains under 6 systems of Coastal bermudagrass utilization. J. Range Manage. 29: 372.

Horn, F. P., D. G. Wagner, R. R. Oltjen, T. Rumsey and A. D. Tillman. 1974. Observation on the preconditioning effect of wheat pasture, its nutritive value and the health of grazing steers. Anim. Sci. and Ind. Res. Rep. MP-92. Okla. Agr. Exp. Sta. and USDA p. 7.

Horton, G. M. J. and W. Holmes. 1978. Compensatory growth by beef cattle at grassland or on alfalfa-based diets. J. Anim. Sci. 46: 297.

Hoveland, C. S., W. B. Anthony, J. A. Mcguire and J. G. Starling. 1978. Beef cow-calf performance on Coastal bermudagrass overseeded with winter annual clovers and grasses. Agron. J. 70:418.

Hull, J. L., C. A. Raguse, D. W. Henderson and J. H. Meyer. 1969. Supplementation of a dry annual range simulating roughage by use of irrigated pasture. J. Anim. Sci. 28: 683.

Ikerd, J. E. 1978. Market Viewpoints. Department of Agricultural Economics, Oklahoma State University, Stillwater, Oklahoma.

Jones, S. D. M., M. A. Price and R. T. Berg. 1978. A review of carcass density, its measurement and relationship with bovine carcass fatness. J. Anim. Sci. 46: 1151.

Kay, M., R. Massie and A. MacDearmid. 1971. Intensive beef production. 12. Replacement of concentrates with chopped dried grass. Anim. Prod. 13: 101.

Kelley, R. F., J. P. Fontenot, P. P. Graham, W. S. Wilkinson and C. M. Kincaid. 1968. Estimates of carcass composition of beef cattle fed at different planes of nutrition. J. Anim. Sci. 27: 620.

Kromann, R. P., J. H. Meyer and J. L. Hull. 1961. Energy requirements of grazing steers. J. Anim. Sci. 20: 450.

Lake, R. P., D. C. Clanton and J. F. Karn. 1974a. Intake, digestibility and nitrogen utilization of steers consuming irrigated pasture as influenced by limited energy supplementation. J. Anim. Sci. 38: 1291.

Lake, R. P., R. L. Hildebrand, D. C. Clanton and L. E. Jones. 1974b. Limited energy supplementation of yearling steers grazing irrigated pasture and subsequent feedlot performance. J. Anim. Sci. 39: 827.

Ledger, H. P. 1977. The utilization of dietary energy by steers during periods of restricted food intake and subsequent realimentation. 2. The comparative energy requirements of penned and exercised steers for long term maintenance at constant live weight. J. Agr. Sci. 88: 27.

Levy, D., Y. Folman, Z. Holzer and D. Drori. 1971. Compensatory growth in intensively raised bull calves. J. Anim. Sci. 33: 1078.

Lofgreen, G. P., D. L. Bath and H. T. Strong. 1963. Net energy of successive increments of feed above maintenance for beef cattle. J. Anim. Sci. 22: 598.

Lowrey, R. S., G. V. Calvert, H. C. McCampbell and Frank Woods. 1976a. Finishing weanling steers on winter pasture with or without grain. J. Anim. Sci. 42: 260 (Abstr.).

Lowrey, R. S., H. C. McCampbell, G. V. Calvert, E. Beaty and Frank Woods. 1976b. Effect of previous treatment and energy levels on finishing yearling steers on winter pasture. J. Anim. Sci. 42: 260 (Abstr.).

McCampbell, H. C., R. S. Lowrey, G. V. Calvert and Frank Woods. 1976. Influence of age and energy levels on finishing yearling steers on winter pasture. J. Anim. Sci. 42: 261 (Abstr.).

McClaugherty, F. S., J. P. Fontenot, M. B. Wise and R. C. Carter. 1975. High forage systems of fattening cattle. J. Anim. Sci. 40: 181 (Abstr.).

McCormick, W. C., W. H. Marchant and B. L. Southwell. 1967. Coastal bermudagrass and Pensacola bahiagrass for wintering beef calves. Ga. Agr. Exp. Sta. Res. Bull. 19.

McCrosky, J. E., N. E. Brackett and Robert Renbarger. 1968. Seasonal variation in the composition and digestibility of Midland bermudagrass. Anim. Sci. Res. Rep. MP-80 Okla. Agr. Exp. Sta. p. 80.

McMurphy, W. E. and B. B. Tucker. 1974. Midland bermudagrass pasture research. Okla. Agr. Exp. Sta. Res. Rep. P-705.

Meyer, J. H. and W. J. Clawson. 1964. Undernutrition and subsequent realimentation in rats and sheep. J. Anim. Sci. 23: 214.

Meyer, J. H., J. L. Hull, W. H. Weitkamp and S. Bonilla. 1965. Compensatory growth responses of fattening steers following various low energy intake regimes on hay or irrigated pasture. J. Anim. Sci. 24: 29.

Mott, G. O., C. L. Rhykerd, R. W. Taylor, T. W. Perry and D. A. Huber. 1968. Techniques for measuring the contribution of pasture in pasture-grain feeding systems. In Forage Economics - Quality (ed. C. M. Harrison). Spec. Publ. Am. Soc. Agron. Madison, Wisconsin, No. 13.

Nichols, N. E. and A. L. Lesperance. 1974. Factors affecting range performance of yearling steers. Proc. Western Sect. Am. Soc. Anim. Sci. 25: 189.

NRC. 1976. Nutrient Requirements of Domestic Animals, No. 4. Nutrient Requirements of Beef Cattle. Fifth Revised Ed. National Academy of Science - National Research Council, Washington, D.C.

Oklahoma State University Cooperative Extension Service. 1978. Oklahoma State University Enterprise Budgets. Farm Management Extension, Department of Agricultural Economics.

Oliver, W. M. 1973. Grazing stocker cattle on Coastal bermudagrass. Louisiana Agr. 16: 5.

Oliver, W. M. 1976. Meet. of the Louisiana Forage Council at the N. Louisiana Hill Farm Exp. Sta.

Oliver, W. M. 1978. Management of Coastal bermudagrass being grazed with stocker cattle. B. Proc. Forage-Livestock Conf. Intensive Forage Utilization. Kerr Foundation, Inc., Poteau, Okla.

Pate, F. M., J. R. Crockett, S. W. Coleman, F. S. Baker, Jr. and A. Z. Palmer. 1976. Finishing steers on pasture-drylot vs drylot. J. Anim. Sci. 43: 268.

Peacock, F. M., W. G. Kirk, E. M. Hodges, A. Z. Palmer and H. W. Carpenter. 1964. The effect of winter gains on beef calves on subsequent feedlot performance. Florida Agr. Exp. Sta. Tech. Bull. 667.

Reardon, T. F. 1975. Live weight and carcass responses of grazing steers to supplements in summer. Proc. N. Z. Soc. Anim. Prod. 35: 169.

Ribeiro, J. M. De C. R., J. M. Brockway and A. J. F. Webster. 1977. A note on the energy cost of walking in cattle. Anim. Prod. 25: 107.

Roark, C. B., H. E. Harris and J. I. Feazel. 1966. Winter pasture for fattening feeder calves in the upland area of West Louisiana. La. Agr. Exp. Sta. Bull. 609.

Roark, C. B., H. E. Harris and J. I. Feazel. 1968. Three methods of finishing steers for slaughter. La. Agr. Exp. Sta. Bull. 630.

Schupp, A., T. Bidner, W. McKnight, J. Carpenter, Jr. and D. Smith. 1976. Consumer acceptance of forage finished and limited grain finished beef. Phase 1. La.: D. A. E. Res. Rep. No. 503.

Schupp, A. T. Bidner, W. McKnight, J. Carpenter, Jr. and D. Smith. 1976. Consumer acceptance and feasibility of production of forage finished and limited grain finished beef. Phase 2. La.: D. A. E. Res. Rep. No. 509.

Spooner, A. E. and Maurice L. Ray. 1977. Finishing steers on pasture versus drylot. Forage and Grassland Progress 28: 3.

Spooner, A. E. and Maurice L. Ray. 1978. Potential for using pasture forage to finish slaughter cattle. J. Proc. Forage - Livestock Conf. Intensive Forage Utilization. Kerr Foundation, Inc., Poteau, Okla.

Tayler, J. C. and J. M. Wilkinson. 1972. The influence of level of concentrate feeding on the voluntary intake of grass and on live-weight gain by cattle. Anim. Prod. 14: 85.

Telford, J. P., F. P. Horn, D. F. Stephens, J. E. McCroskey, J. V. Whiteman and Robert Totusek. 1974. Three levels of nitrogen fertilization for bermudagrass. Anim. Sci. and Ind. Res. Rep. MP-92. Okla. Agr. Exp. Sta. and USDA p. 70.

Tilley, J. M. A. and R. A. Terry. 1963. A two-stage technique for the in vitro digestion of forage crops. J. Brit. Grassland Soc. 18: 104.

Utley, P. R., W. H. Marchant and W. C. McCormick. 1976. Evaluation of annual grass forages in prepared seedbeds and overseeded into perennial sods. J. Anim. Sci. 42: 16.

Utley, P. R., W. H. Marchant and W. C. McCormick. 1977. Winter annual pastures for growing beef calves. Ga. Agr. Res. 18 (4).

Utley, P. R. and W. C. McCormick. 1975. Dry or high-moisture corn for finishing steers in drylot or on oat pasture. J. Anim. Sci. 41: 495.

Utley, P. R. and W. C. McCormick. 1976. Corn or grain sorghum for finishing steers in drylot or on rye pastures. J. Anim. Sci. 43: 1141.

Utley, P. R., G. L. Newton, W. G. Monson, R. E. Hellwig and W. C. McCormick. 1978. Relationships among laboratory analysis of pelleted warm season grasses and animal performance. J. Anim. Sci. 47: 276.

Van Soest, P. J. and L. A. Moore. 1965. New chemical methods for analysis of forages for the purpose of predicting nutritive value. Proc. 9th Inter. Grassland Congress. p. 783.

Wilson, B. R., G. W. Horn and W. E. McMurphy. 1977. Summer performance and forage intake of stockers grazed on bermudagrass. Anim. Sci. Res. Rep. MP-101. Okla. Agr. Exp. Sta. and USDA p. 22.

Wilson, P. N. and D. F. Osbourn. 1960. Compensatory growth after undernutrition in mammals and birds. Biol. Rev. 35: 324.

Wyatt, R. D. 1977. Forage alternatives with wheat. Proc. 3rd Annu. Kansas-Oklahoma Beef Cattle Conf.

APPENDIX A

TABLES

TABLE 17. FORAGE YIELD AND ANALYSIS OF SMALL GRAINS INTERSEEDED BERMUDAGRASS PASTURES, 1977

Finishing group	Date	Yield kg/ha[a]	Crude protein, %[a]	IVDMD, %[b]
Pasture - 56 days[c]	March 14	---	18.83	59.28
	April 11	635	16.59	69.30
Pasture - entire summer[d]	March 14	---	19.02	59.85
	April 11	805	18.74	64.01
	May 19	3342	13.92	50.47
Grain on grass[d]	March 14	---	18.49	57.49
	April 11	695	16.19	69.56
	May 19	2078	11.11	50.42

[a]Expressed on a dry matter basis.

[b]*In vitro* dry matter digestibility.

[c]Values represent means of 2 pastures.

[d]Values represent means of 4 pastures.

TABLE 18. FORAGE YIELD AND ANALYSIS OF SMALL GRAINS INTERSEEDED BERMUDAGRASS PASTURES, 1978

Finishing group	Date	Yield kg/ha[a]	Crude protein, %[a]	IVDMD, %[b]
Pasture - 63 days[c]	April 12	760	22.02	63.90
	May 12	1830	15.54	71.69
	June 14	1440	15.87	70.50
Pasture-entire summer[d]	April 12	1220	24.49	73.00
	May 12	2203	13.93	65.41
	June 14	1365	12.03	62.78
	July 31	2150	7.80	47.79
	September 13	2305	8.41	46.02
Grain on grass[d]	April 12	945	22.40	68.41
	May 12	2130	15.87	69.08
	June 14	1190	13.59	60.83
	July 31	1835	9.34	46.14
	September 13	2175	9.80	45.34

[a]Expressed on a dry matter basis.

[b]*In vitro* dry matter digestibility.

[c]Values represent means of 2 pastures.

[d]Values represent means of 4 pastures.

TABLE 19. STEER GRAZING DAYS PER HECTARE PER MONTH FOR SMALL GRAINS-INTERSEEDED BERMUDAGRASS PASTURES[a]

Pasture:	1	2	3	4
March				
1977 (16)	35	35	35	35
1978 (29)	5	5	5	5
April				
1977	66	66	66	66
1978	53	53	53	53
May				
1977	68	68	68	68
1978	55	76	72	63
June				
1977	66	86	66	86
1978	53	66	60	71
July				
1977	79	79	90	79
1978	58	65	55	58
August				
1977	68	126 (29)	68	137
1978	56	55	55	56
September				
1977	20 (9)	0	20 (9)	124 (29)
1978 (24)	59	51	42	59
Total				
1977	402	460	413	595
1978	339	371	342	365

[a]Parenthetical numbers are dates in March and September or August when steers were put in and taken out of pastures, respectively.

TABLE 20. FEEDER AND FED STEER PRICES ($/CWT) UTILIZED IN ENTERPRISE BUDGETS

Steer wt., lb	Unadjusted steer price[a]	Purchase month[b]	Month steers sold[b]						
		Oct	Mar	Apr	May	June	July	Aug	Sept
400-500	77.00	74.90	77.90						
500-600	73.00		73.50		75.40				
600-700	69.00		69.50		70.50				
700	67.00							68.50	
700-800	65.00				66.40				
800	62.50								61.80
800-900	60.00								59.30
>900[c]	57.00					58.00	58.40	58.50	56.40
Fed steers	55.00			56.10	57.00	56.70	57.80	57.80	54.60

[a]Determined from general price relationships among grades and weights of steers sold in the fall of 1978 (Ikerd, 1978).

[b]Adjusted for seasonal variation by multiplying the unadjusted price by the 10 year average ratio for the month steers were bought and sold (Blakley, 1978).

[c]Steer groups that were slaughtered, but carcass quality grades averaged below low-choice were priced in this weight range as heavy feeders.

TABLE 21. CONVERSION OF STEER AVERAGE DAILY GAINS TO ANIMAL UNIT MONTH (AUM) EQUIVALENCE[a]

Body weight, kg	Daily gain, kg	TDN requirements, kg	AUM equivalent
150	0.0	1.5	.3
	.25	2.0	.3
	.50	2.3	.4
	.75	2.5	.4
200	0.0	1.9	.4
	.25	2.6	.5
	.50	3.1	.5
	.75	3.5	.5
300	0.0	2.6	.5
	.25	3.5	.6
	.50	4.4	.8
	.75	5.0	.8
400	0.0	3.2	.6
	.25	4.4	.8
	.50	5.5	1.0
	.75	6.3	1.0

[a]1 AUM unit is equivalent to a 454 kg cow nursing a calf.

TABLE 22. PRODUCTION INPUTS INCLUDED IN NON-FEED AND FEED COSTS OF RESOURCE CASES A AND B FOR THE ALL-FORAGE PRODUCTION SYSTEMS

Case A		Case B	
Non-feed	Feed	Non-Feed	Feed
Death loss	Starter feed	Death loss	Starter feed
Loses attributed to negative cattle margins	Salt and mineral	Loses attributed to negative cattle margins	Salt and mineral
Medication	Cottonseed cake	Medication	Cottonseed cake
Trucking	Bermudagrass hay	Trucking	Overseeding bermudagrass pasture
Order buyer	Wheat pasture	Order buyer	
Sales commission	Bermudagrass (native) pasture	Sales commission	
Taxes	Overseeding bermuda-grass pasture	Taxes	
Machinery fuel and lubrication		Machinery fuel and lubrication	
Machinery and equipment repair		Machinery and equipment repair	
Annual operating capital		Annual operating capital	
Machinery and equipment investment			
Ownership			
Labor			

APPENDIX B

COMPUTER PRINTOUT OF

ENTERPRISE BUDGETS

(1976-77)

STOCKER STEERS ON WHEAT PASTURE - NOV 17 TO MAR 16, 1977
STK RATE 1 STR / 2 AC - BUY 425 SELL 646 LB
HEREFORD X ANGUS (2% DEATH LOSS)

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STRS(6-7)CH	CWT.	0.98	6.46	69.500	448.97	439.99
TOTAL RECEIPTS						439.99

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
S.G. PASTURE	AUMS	2.88	1.00	2.883	18.00	51.89
BERMUDA HAY	TONS	0.08	1.00	0.080	37.50	3.00
SALT & MIN.	LBS.	7.45	1.00	7.450	0.08	0.60
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
VET & MED.	HD.	1.00	1.00	1.000	2.06	2.06
TRUCKING	CWT.	10.71	1.00	10.710	0.25	2.68
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
MACH. FUEL & LUBE						1.64
MACHINERY REPAIR COST						0.89
EQUIPMENT REPAIR						0.22
TOTAL OPERATING COST						392.26

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	47.73

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	145.910	14.59
MACHINERY INVESTMENT	0.100	6.401	0.64
EQUIPMENT INVESTMENT	0.100	4.362	0.44
TOTAL INTEREST CHARGE			15.67

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	32.07

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	1.07
EQUIPMENT	DOL.	1.02
TOTAL OWNERSHIP COST		2.09

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	29.97

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.056	3.17
EQUIPMENT LABOR	3.000	0.220	0.66
LIVESTOCK LABOR	3.000	1.000	3.00
TOTAL LABOR COST		2.276	6.83

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	23.15

COST PER AUM FIGURED ON STARTING WEIGHT (425) X $2.25/CWT/MO MADER,MCKENNEY
USED TDN BASIS FOR AUM REQUIREMENTS ADG 1.86
STEER BUY & SELL PRICE - 10 YR AVG SEASONALLY ADJUSTED 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 4 MACH. COMP. 12 IND. NUMBER 6 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 3
PROCESSED BY DEPT. OF AGRI. ECON. - OKLAHOMA STATE UNIVERSITY
PROGRAM DEVELOPED BY DEPT. OF. AGRI. ECON. OKLAHOMA STATE UNIVERSITY
DATE PRINTED:02/21/79

WHEAT PASTURE STOCKER TO 646 LBS., 119 DAY
GRAZE OVERSEEDED BERMUDAGRASS, 56 DAYS, MAR. 16 TO MAY 11, 1977

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STR (7-8)CH	CWT.	0.98	7.51	66.400	498.66	488.69
TOTAL RECEIPTS						488.69

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
S.G. PASTURE	AUMS	2.88	1.00	2.883	18.00	51.89
BERMUDA HAY	TONS	0.08	1.00	0.080	37.50	3.00
SALT & MIN.	LBS.	11.00	1.00	11.000	0.08	0.88
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
VET & MED.	HD.	1.00	1.00	0.996	2.12	2.11
TRUCKING	CWT.	11.76	1.00	11.760	0.25	2.94
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	1.80	1.00	1.800	14.00	25.20
MACH. FUEL & LUBE						2.24
MACHINERY REPAIR COST						1.22
EQUIPMENT REPAIR						0.28
TOTAL OPERATING COST						419.04

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	69.65

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	212.733	21.27
MACHINERY INVESTMENT	0.100	8.729	0.87
EQUIPMENT INVESTMENT	0.100	7.050	0.70
TOTAL INTEREST CHARGE			22.85

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	46.80

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	1.46
EQUIPMENT	DOL.	1.60
TOTAL OWNERSHIP COST		3.06

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	43.74

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.440	4.32
EQUIPMENT LABOR	3.000	0.250	0.75
LIVESTOCK LABOR	3.000	1.320	3.96
TOTAL LABOR COST		3.010	9.03

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	34.71

STOCKER ADG. 1.86 LBS.: O.S. BERMUDA ADG. 1.88 MADER
ESTABLISHMENT COSTS OF OVERSEEDED BERMUDAGRASS IS ON CUSTOM BASIS,
COSTS ARE PRORATED BY AUM UNITS OVER A 2 MONTH PERIOD. 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 1 MACH. COMP. 12 IND. NUMBER 2 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 5

PROCESSED BY DEPT. OF AGRI. ECON. - OKLAHOMA STATE UNIVERSITY
PROGRAM DEVELOPED BY DEPT. OF. AGRI. ECON. OKLAHOMA STATE UNIVERSITY
DATE PRINTED:02/21/79

WHEAT PASTURE STOCKER TO 646 LBS., 119 DAYS
GRAZED ON SMALL GRAINS OVERSEEDED BERMUDA PASTURES, 197 DAYS
MAR 16 TO SEPT 29, 1977

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STEERS (8-9)	CWT.	0.98	8.35	59.300	495.15	485.25
TOTAL RECEIPTS						485.25

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
S.G. PASTURE	AUMS	2.88	1.00	2.883	18.00	51.89
BERMUDA HAY	TONS	0.C8	1.00	0.080	37.50	3.00
SALT & MIN.	LBS.	19.81	1.00	19.810	0.08	1.58
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
NATIVE PASTURE	AUMS	4.50	1.00	4.500	5.00	22.50
VET & MED.	HD.	1.00	1.00	1.000	2.13	2.13
TRUCKING	CWT.	12.60	1.00	12.600	0.25	3.15
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	1.80	1.00	1.800	14.00	25.20
MACH. FUEL & LUBE						3.59
MACHINERY REPAIR COST						1.94
EQUIPMENT REPAIR						0.28
TOTAL OPERATING COST						443.15

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	42.11

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	354.292	35.43
MACHINERY INVESTMENT	0.100	13.966	1.40
EQUIPMENT INVESTMENT	0.100	7.050	0.70
TOTAL INTEREST CHARGE			37.53

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	4.57

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.33
EQUIPMENT	DOL.	1.60
TOTAL OWNERSHIP COST		3.94

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	0.64

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	2.304	6.91
EQUIPMENT LABOR	3.000	0.250	0.75
LIVESTOCK LABOR	3.000	2.040	6.12
TOTAL LABOR COST		4.594	13.78

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-13.14

ADG: STOCKER, 1.86 LB: 1ST 56 DAYS GRAZING, 1.88 LB: ENTIRE 197 DAYS, .96 LB
ESTABLISHMENT COST OF OVERSEEDED BERMUDAGRASS IN ON CUSTOM BASIS,
COSTS ARE PRORATED BY AUM UNITS OVER A 2 MONTH PERIOD. 02/21/79 MADER
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 1 MACH. COMP. 12 IND. NUMBER 4 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 9

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DATE PRINTED:02/21/79

WHEAT PASTURE STOCKER TO 646 LBS., 119 DAYS
FED GRAIN AD LIB ON GRASS TO FINISH, 108 DAYS, MAR. 16 TO JULY 2, 1977

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.98	8.98	58.400	524.43	513.94
BERMUDA HAY	TONS	2.00	1.00	37.500	37.50	75.00
TOTAL RECEIPTS						588.94

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
S.G. PASTURE	AUMS	2.88	1.00	2.883	18.00	51.89
BERMUDA HAY	TONS	0.08	1.00	0.080	37.50	3.00
SALT & MIN.	LBS.	7.45	1.00	7.450	0.08	0.60
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
NATIVE PASTURE	AUMS	1.88	1.00	1.880	5.00	9.40
VET & MED.	HD.	1.00	1.00	1.000	2.11	2.11
TRUCKING	CWT.	13.23	1.00	13.230	0.25	3.31
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	1.80	1.00	1.800	14.00	25.20
C.S. HULLS	CWT.	394.51	0.01	3.945	3.25	12.82
CORN	CWT.	1403.55	0.01	14.036	4.29	60.21
S.B. MEAL	CWT.	261.61	0.01	2.616	8.50	22.24
SUPPLEMENT	CWT.	145.46	0.01	1.455	4.29	6.24
FEED PROCESSING	TONS	110.27	0.01	1.103	2.00	2.21
FEED DELIVERY	TONS	110.27	0.01	1.103	2.00	2.21
FEED MARKUP	TONS	110.27	0.01	1.103	7.50	8.27
CUST HAY REMOVAL	TONS	2.00	1.00	2.000	22.50	45.00
MACH. FUEL & LUBE						5.71
MACHINERY REPAIR COST						1.97
EQUIPMENT REPAIR						0.75
TOTAL OPERATING COST						591.01

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-2.07

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	303.793	30.38
MACHINERY INVESTMENT	0.100	21.270	2.13
EQUIPMENT INVESTMENT	0.100	17.825	1.78
TOTAL INTEREST CHARGE			34.29

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-36.36

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	3.76
EQUIPMENT	DOL.	3.35
TOTAL OWNERSHIP COST		7.11

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-43.46

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	2.688	8.06
EQUIPMENT LABOR	3.000	0.370	1.11
LIVESTOCK LABOR	3.000	2.360	7.08
TOTAL LABOR COST		5.418	16.25

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-59.72

STOCKER ADG, 1.86 LB. - FINISH ADG, 2.35 LB MADER
ESTABLISHMENT COST OF OVERSEEDED BERMUDAGRASS IS ON CUSTOM BASIS,
THESE COSTS PRORATED BY AUM UNITS OVER A 2 MONTH PERIOD.02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 1 MACH. COMP. 12 IND. NUMBER 3 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 7

PROCESSED BY DEPT. OF AGRI. ECON. - OKLAHOMA STATE UNIVERSITY
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WHEAT PASTURE STOCKER TO 646 LB (119 DAYS).
COMMERCIAL FEEDLOT FINISH, MARCH 16 --> JUNE 16, 1977
AD LIB - 92 DAYS

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS CHOICE	CWT.	0.98	9.23	56.700	523.34	512.87
TOTAL RECEIPTS						512.87

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
S.G. PASTURE	AUMS	2.88	1.00	2.883	18.00	51.89
BERMUDA HAY	TONS	0.08	1.00	0.080	37.50	3.00
SALT & MIN.	LBS.	7.45	1.00	7.450	0.08	0.60
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
VET & MED.	HD.	1.00	1.00	1.000	2.10	2.10
TRUCKING	CWT.	19.94	1.00	19.940	0.25	4.98
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. HULLS	CWT.	450.60	0.01	4.506	3.25	14.64
CORN	CWT.	1529.20	0.01	15.292	4.29	65.60
S.B. MEAL	CWT.	290.80	0.01	2.908	8.50	24.72
SUPPLEMENT	CWT.	161.00	0.01	1.610	4.29	6.91
FEED MARGIN	DAYS	92.00	1.00	92.000	0.15	13.80
FEEDLOT CHARGE	DAYS	92.00	1.00	92.000	0.05	4.60
MACH. FUEL & LUBE						1.64
MACHINERY REPAIR COST						0.89
EQUIPMENT REPAIR						0.28
TOTAL OPERATING COST						524.94

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-12.06

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	259.254	25.93
MACHINERY INVESTMENT	0.100	6.401	0.64
EQUIPMENT INVESTMENT	0.100	7.050	0.70
TOTAL INTEREST CHARGE			27.27

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-39.33

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	1.07
EQUIPMENT	DOL.	1.60
TOTAL OWNERSHIP COST		2.67

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-42.01

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.056	3.17
EQUIPMENT LABOR	3.000	0.250	0.75
LIVESTOCK LABOR	3.000	1.000	3.00
TOTAL LABOR COST		2.306	6.92

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-48.92

STOCKER ADG 1.86 LB
FINISH PHASE ADG 3.01 LB

MADER

02/21/79

ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 1 MACH. COMP. 12 IND. NUMBER 1 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 6

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STOCKER BUDGET - PER CALF - 100 UNIT
BUY OCT. SELL MAR - BERMUDAGRASS HAY STOCKER PROGRAM
BUY 425 LBS. - SELL 425 LBS.; YR 1976-77

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STRS (4-5)	CWT.	0.98	4.25	77.900	331.07	324.45
TOTAL RECEIPTS						324.45

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
BERMUDA HAY	TONS	0.66	1.00	0.660	37.50	24.75
SALT & MIN.	LBS.	7.45	1.00	7.450	0.08	0.60
STARTER FEED	LBS.	0.38	1.00	0.380	7.10	2.70
COTTONSEED CAKE	CWT.	0.44	1.00	0.440	9.00	3.96
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
VET & MED.	HD.	1.00	1.00	1.000	2.06	2.06
TRUCKING	CWT.	8.50	1.00	8.500	0.25	2.13
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
MACH. FUEL & LUBE						3.17
MACHINERY REPAIR COST						0.84
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						367.72
RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT						-43.26

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	141.908	14.19
MACHINERY INVESTMENT	0.100	11.589	1.16
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			18.00
RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT			-61.26

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.09
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		5.79
RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT		-67.06

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.272	3.82
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	1.000	3.00
TOTAL LABOR COST		2.451	7.35
RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT			-74.41

2% DEATH LOSS; STOCKER ADG 0.0 (119 DAYS) MADER,MCKENNEY
SELL PRICE DOES NOT REFLECT ADJUSTMENT FOR COMPENSATORY GAIN
STEER BUY & SELL PRICE - 10 YR. AVG. SEASONALLY ADJUSTED02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 4 MACH. COMP. 12 IND. NUMBER 1 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 3
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BERMUDAGRASS HAY STOCKER, 119 DAYS
GRAZE OVERSEEDED BERMUDAGRASS, 56 DAYS, MAR. 16 TO MAY 11, 1977

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STRS (5-6)	CWT.	0.98	5.41	75.400	407.91	399.76
TOTAL RECEIPTS						399.76

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
BERMUDA HAY	TONS	0.66	1.00	0.660	37.50	24.75
SALT & MIN.	LBS.	11.00	1.00	11.000	0.08	0.88
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
COTTONSEED CAKE	CWT.	0.44	1.00	0.440	9.00	3.96
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
O.S. BERMUDA	AUMS	1.52	1.00	1.520	14.00	21.28
VET & MED.	HD.	0.99	1.00	0.991	2.12	2.10
TRUCKING	CWT.	9.66	1.00	9.660	0.25	2.41
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
MACH. FUEL & LUBE						3.77
MACHINERY REPAIR COST						1.17
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						390.53

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	9.22

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	204.323	20.43
MACHINERY INVESTMENT	0.100	13.917	1.39
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			24.48

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-15.25

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.48
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		6.18

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-21.43

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.656	4.97
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	1.320	3.96
TOTAL LABOR COST		3.155	9.46

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-30.90

STOCKER ADG. 0.00 LB.; O.S. BERMUDA ADG. 2.08 LB. MADER
ESTABLISHMENT COST OF OVERSEEDED BERMUDAGRASS IS ON CUSTOM BASIS,
THESE COSTS ARE PRORATED BY AUM UNITS OVER A 2 MO PERIOD02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 4 MACH. COMP. 12 IND. NUMBER 1 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 5

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BERMUDAGRASS HAY STOCKER (119 DAYS) 425 LB
GRAZE OVERSEEDED BERMUDAGRASS MAR. 16 --> MAY 11 (56 DAYS) 541 LB
AD LIB FINISH IN COMMERCIAL FEEDLOT MAY 11 --> AUGUST 26, 1977 (107 DAYS)

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.98	9.19	57.800	531.18	520.56
TOTAL RECEIPTS						520.56

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
BERMUDA HAY	TONS	0.66	1.00	0.660	37.50	24.75
SALT & MIN.	LBS.	11.00	1.00	11.000	0.08	0.88
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
COTTONSEED CAKE	CWT.	0.44	1.00	0.440	9.00	3.96
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
O.S. BERMUDA	AUMS	1.52	1.00	1.520	14.00	21.28
VET & MED.	HD.	1.00	1.00	1.000	2.12	2.12
TRUCKING	CWT.	18.86	1.00	18.860	0.25	4.71
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. HULLS	CWT.	494.17	0.01	4.942	3.25	16.06
CORN	CWT.	1719.45	0.01	17.195	4.29	73.76
S.B. MEAL	CWT.	371.82	0.01	3.718	8.50	31.60
SUPPLEMENT	CWT.	135.98	0.01	1.360	4.29	5.83
FEED MARGIN	DAYS	107.00	1.00	107.000	0.15	16.05
FEEDLOT CHARGE	DAYS	107.00	1.00	107.000	0.05	5.35
MACH. FUEL & LUBE						3.77
MACHINERY REPAIR COST						1.17
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						541.51

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-20.96

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	318.353	31.84
MACHINERY INVESTMENT	0.100	13.917	1.39
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			35.88

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-56.83

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.48
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		6.18

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-63.02

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.656	4.97
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	1.320	3.96
TOTAL LABOR COST		3.155	9.46

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-72.48

STOCKER ADG 0.00 LBS / O.S. BERMUDA 2.08 LBS ADG / FEEDLOT ADG 3.53 LBS MADER
CUSTOM BASIS FOR OVERSEEDED BERMUDAGRASS ESTABLISHMENT.
COSTS PRORATED BY AUM UNITS OVER 2 MO. PERIOD. 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 4 MACH. COMP. 12 IND. NUMBER 5 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 8

PROCESSED BY DEPT. OF AGRI. ECON. - OKLAHOMA STATE UNIVERSITY
PROGRAM DEVELOPED BY DEPT. OF. AGRI. ECON. OKLAHOMA STATE UNIVERSITY
DATE PRINTED:02/21/79

BERMUDAGRASS HAY STOCKER, 119 DAYS
GRAZED ON SMALL GRAINS OVERSEED BERMUDA PASTURES, 163 DAYS
MAR. 16 TO AUG. 26, 1977

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STRS (7)CH	CWT.	0.98	7.07	68.500	484.29	474.61
TOTAL RECEIPTS						474.61

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
BERMUDA HAY	TONS	0.66	1.00	0.660	37.50	24.75
SALT & MIN.	LBS.	17.99	1.00	17.990	0.08	1.44
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
COTTONSEED CAKE	CWT.	0.44	1.00	0.440	9.00	3.96
NATIVE PASTURE	AUMS	3.05	1.00	3.050	5.00	15.25
VET & MED.	HD.	1.00	1.00	1.000	2.12	2.12
TRUCKING	CWT.	11.32	1.00	11.320	0.25	2.83
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. BERMUDA	AUMS	1.52	1.00	1.520	14.00	21.28
MACH. FUEL & LUBE						4.78
MACHINERY REPAIR COST						1.71
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						406.93

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	67.68

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	302.496	30.25
MACHINERY INVESTMENT	0.100	17.845	1.78
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			34.69

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	32.99

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	3.14
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		6.84

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	26.15

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	2.304	6.91
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	1.860	5.58
TOTAL LABOR COST		4.343	13.03

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	13.12

ADG'S: STOCKER, 0.00 LB: 1ST 56 DAY GRAZING, 2.08 LB: ENTIRE 163 DAYS, 1.73 LB
ESTABLISHMENT COSTS OF OVERSEEDED BERMUDAGRASS IS ON CUSTOM BASIS,

02/21/79 MADER

ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 4 MACH. COMP. 12 IND. NUMBER 8 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 8

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PROGRAM DEVELOPED BY DEPT. OF. AGRI. ECON. OKLAHOMA STATE UNIVERSITY
DATE PRINTED:02/21/79

BERMUDAGRASS HAY STOCKER, 119 DAYS
FED GRAIN AD LIB ON GRASS TO FINISH, 163 DAYS, MAR. 16 TO AUG. 26, 1977

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.98	8.66	58.500	506.61	496.48
BERMUDA HAY	TONS	2.00	1.00	37.500	37.50	75.00
TOTAL RECEIPTS						571.48

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
BERMUDA HAY	TONS	0.66	1.00	0.660	37.50	24.75
SALT & MIN.	LBS.	7.45	1.00	7.450	0.08	0.60
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
COTTON SEED CAKE	CWT.	0.44	1.00	0.440	9.00	3.96
NATIVE PASTURE	AUMS	3.58	1.00	3.580	5.00	17.90
O.S. BERMUDA	AUMS	1.52	1.00	1.520	14.00	21.28
VET & MED.	HD.	1.00	1.00	1.000	2.12	2.12
TRUCKING	CWT.	12.91	1.00	12.910	0.25	3.23
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. HULLS	CWT.	483.65	0.01	4.836	3.25	15.72
CORN	CWT.	1995.85	0.01	19.958	4.29	85.62
S.B. MEAL	CWT.	405.73	0.01	4.057	8.50	34.49
SUPPLEMENT	CWT.	190.00	0.01	1.900	4.29	8.15
FEED PROCESSING	TONS	153.77	0.01	1.538	2.00	3.08
FEED DELIVERY	TONS	153.77	0.01	1.538	2.00	3.08
FEED MARKUP	TONS	153.77	0.01	1.538	7.50	11.53
CUST HAY REMOVAL	TONS	2.00	1.00	2.000	22.50	45.00
MACH. FUEL & LUBE						9.24
MACHINERY REPAIR COST						2.46
EQUIPMENT REPAIR						1.41
TOTAL OPERATING COST						621.48

RETURNS TO LAND, LABOR, CAPITAL, MACHINERY, OVERHEAD, RISK, AND MANAGEMENT	-50.00

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	330.484	33.05
MACHINERY INVESTMENT	0.100	33.784	3.38
EQUIPMENT INVESTMENT	0.100	37.296	3.73
TOTAL INTEREST CHARGE			40.16

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-90.16

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	6.10
EQUIPMENT	DOL.	5.45
TOTAL OWNERSHIP COST		11.55

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-101.71

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	3.708	11.12
EQUIPMENT LABOR	3.000	0.299	0.90
LIVESTOCK LABOR	3.000	3.050	9.15
TOTAL LABOR COST		7.057	21.17

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-122.88

STOCKER ADG, 0.00 LB. - FINISH ADG, 2.72 LB. MADER
ESTABLISHMENT COST OF OVERSEEDED BERMUDAGRASS IS ON CUSTOM BASIS.
THESE COSTS ARE PRORATED BY AUM UNITS OVER A 2 MO PERIOD02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 4 MACH. COMP. 12 IND. NUMBER 0 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 8

PROCESSED BY DEPT. OF AGRI. ECON. - OKLAHOMA STATE UNIVERSITY
PROGRAM DEVELOPED BY DEPT. OF. AGRI. ECON. OKLAHOMA STATE UNIVERSITY

BERMUDAGRASS HAY STOCKER (119 DAYS)
AD LIB FINISH COMMERCIAL FEEDLOT MAR 16 - AUGUST 16, 1977
153 DAYS

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.98	9.33	57.800	539.27	528.49
TOTAL RECEIPTS						528.49

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
BERMUDA HAY	TONS	0.66	1.00	0.660	37.50	24.75
SALT & MIN.	LBS.	7.45	1.00	7.450	0.08	0.60
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
COTTONSEED CAKE	CWT.	0.44	1.00	0.440	9.00	3.96
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
VET & MED.	HD.	1.00	1.00	1.000	2.12	2.12
TRUCKING	CWT.	17.83	1.00	17.830	0.25	4.46
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. HULLS	CWT.	599.04	0.01	5.990	3.25	19.47
CORN	CWT.	2251.37	0.01	22.514	4.29	96.58
S.B. MEAL	CWT.	475.24	0.01	4.752	8.50	40.40
SUPPLEMENT	CWT.	218.75	0.01	2.188	4.29	9.38
FEED MARGIN	DAYS	153.00	1.00	153.000	0.15	22.95
FEEDLOT CHARGE	DAYS	153.00	1.00	153.000	0.05	7.65
MACH. FUEL & LUBE						3.17
MACHINERY REPAIR COST						0.84
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						566.54

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-38.05

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	331.969	33.20
MACHINERY INVESTMENT	0.100	11.589	1.16
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			37.01

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-75.06

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.09
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		5.79

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-80.85

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.272	3.82
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	1.000	3.00
TOTAL LABOR COST		2.451	7.35

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-88.21

STOCKER ADG 0.00 LBS.
FINISH ADG 3.32 LBS.

MADER

02/21/79

ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 4 MACH. COMP. 12 IND. NUMBER 4 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 8

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DATE PRINTED:02/21/79

CHOICE SLAUGHTER STEERS - BUY HEREFORD X ANGUS, 425 LB
COMMERCIAL FEEDLOT FACILITIES UTILIZED
SELL 879 LB, 1% DEATH LOSS - 163 DAYS

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.99	8.79	56.100	493.12	488.19
TOTAL RECEIPTS						488.19

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
C.S. HULLS	CWT.	270.00	0.01	2.700	3.25	8.78
WHOLE CORN	CWT.	2474.11	0.01	24.741	4.29	106.14
60% + PRO. SUP.	CWT.	144.44	0.01	1.444	7.88	11.38
VET & MED.	HD.	1.00	1.00	1.002	2.11	2.11
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TRUCKING	CWT.	17.29	1.00	17.290	0.25	4.32
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
STARTER FEED	CWT.	0.38	1.00	0.380	7.10	2.70
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
FEED MARGIN	DAYS	163.00	1.00	163.000	0.15	24.45
FEEDLOT CHARGE	DAYS	163.00	1.00	163.000	0.05	8.15
MACH. FUEL & LUBE						0.45
MACHINERY REPAIR COST						0.24
EQUIPMENT REPAIR						0.03
TOTAL OPERATING COST						495.33

RETURNS TO LAND, LABOR, CAPITAL, MACHINERY, OVERHEAD, RISK, AND MANAGEMENT	-7.14

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	194.668	19.47
MACHINERY INVESTMENT	0.100	1.746	0.17
EQUIPMENT INVESTMENT	0.100	0.400	0.04
TOTAL INTEREST CHARGE			19.68

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-26.82

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	0.29
EQUIPMENT	DOL.	0.17
TOTAL OWNERSHIP COST		0.46

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-27.28

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	0.288	0.86
EQUIPMENT LABOR	3.000	0.010	0.03
LIVESTOCK LABOR	3.000	0.340	1.02
TOTAL LABOR COST		0.638	1.91

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-29.20

ADG. 2.78 NOV. 16 - APRIL 28, 1977 MADER
WHOLE CORN - COTTONSEED HULL RATION
02/21/79

ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. _6 IND. NUMBER 1 PRICE VECT 1 EQUIP. COMP _2
ANNUAL CAPITAL MONTH: 4

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DATE PRINTED:02/21/79

CHOICE SLAUGHTER STEERS - BUY HEREFORD X ANGUS, 425 LB
OWNERS FEEDLOT FACILITIES UTILIZED
SELL 879 LB, 1% DEATH LOSS; 163 DAYS

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.99	8.79	56.100	493.12	488.19
TOTAL RECEIPTS						488.19

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.25	4.250	74.90	318.32
C.S. HULLS	CWT.	270.00	0.01	2.700	3.25	8.78
WHOLE CORN	CWT.	2474.11	0.01	24.741	4.29	106.14
60% + PRO. SUP.	CWT.	144.44	0.01	1.444	7.88	11.38
FEED PROCESSING	TONS	144.44	0.01	1.444	2.00	2.89
FEED DELIVERY	TONS	144.44	0.01	1.444	2.00	2.89
FEED MARKUP	TONS	144.44	0.01	1.444	7.50	10.83
VET & MED.	HD.	1.00	1.00	1.002	2.11	2.11
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TRUCKING	CWT.	13.04	1.00	13.040	0.25	3.26
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
STARTER FEED	HD.	0.38	1.00	0.380	7.10	2.70
NATIVE PASTURE	AUMS	0.28	1.00	0.280	5.00	1.40
MACH. FUEL & LUBE						5.61
MACHINERY REPAIR COST						1.49
EQUIPMENT REPAIR						0.70
TOTAL OPERATING COST						485.35

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	2.83

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	192.596	19.26
MACHINERY INVESTMENT	0.100	20.511	2.05
EQUIPMENT INVESTMENT	0.100	16.975	1.70
TOTAL INTEREST CHARGE			23.01

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-20.17

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	3.71
EQUIPMENT	DOL.	2.98
TOTAL OWNERSHIP COST		6.68

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-26.85

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	2.251	6.75
EQUIPMENT LABOR	3.000	0.147	0.44
LIVESTOCK LABOR	3.000	1.980	5.94
TOTAL LABOR COST		4.379	13.14

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-39.99

ADG 2.78 NOV. 16 - APRIL 28, 1977 MADER
WHOLE CORN - COTTONSEED HULL RATION
FEED PROCESSED AND DELIVERED FROM COMM. MILL (TRUCK) 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 2 MACH. COMP. 12 IND. NUMBER 8 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 4

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APPENDIX C

COMPUTER PRINTOUT OF ENTERPRISE BUDGETS (1977-78)

STOCKER STEERS ON WHEAT PASTURE - NOV. 9 TO MAR. 29, 1978
STOCKING RATE - 1 STR./2 ACRES - SELL 637 LB., 140 DAYS
HEREFORD X ANGUS (2% DEATH LOSS)

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STRS(6-7)CH	CWT.	0.58	6.37	69.500	442.71	433.86
TOTAL RECEIPTS						433.86

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
S.G. PASTURE	AUMS	3.01	1.00	3.010	18.00	54.18
BERMUDA HAY	TONS	0.20	1.00	0.200	37.50	7.50
SALT & MIN.	LBS.	8.83	1.00	8.830	0.08	0.71
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	11.12	1.00	11.120	0.25	2.78
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
MACH. FUEL & LUBE						1.79
MACHINERY REPAIR COST						0.97
EQUIPMENT REPAIR						0.28
TOTAL OPERATING COST						437.09

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-3.23

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	162.046	16.20
MACHINERY INVESTMENT	0.100	6.983	0.70
EQUIPMENT INVESTMENT	0.100	7.050	0.70
TOTAL INTEREST CHARGE			17.61

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-20.84

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	1.17
EQUIPMENT	DOL.	1.60
TOTAL OWNERSHIP COST		2.77

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-23.61

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.152	3.46
EQUIPMENT LABOR	3.000	0.250	0.75
LIVESTOCK LABOR	3.000	1.080	3.24
TOTAL LABOR COST		2.482	7.45

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-31.05

COST PER AUM FIGURED ON STARTING WT (475 LB) X $2.25/CWT/MO. MADER
USED TDN BASIS FOR AUM REQUIREMENTS, ADG - 1.16 LB.
STEER BUYING & SELLING PRICE 10 YR SEASONALLY ADJ. AVG. 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 2 MACH. COMP. 12 IND. NUMBER 1 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 3
PROCESSED BY DEPT. OF AGRI. ECON. - OKLAHOMA STATE UNIVERSITY
PROGRAM DEVELOPED BY DEPT. OF. AGRI. ECON. OKLAHOMA STATE UNIVERSITY
DATE PRINTED:02/21/79

WHEAT PASTURE STOCKER TO 637 LB, 140 DAYS
GRAZE OVERSEEDED BERMUDAGRASS, 63 DAYS
MAR. 29 TO MAY 31, 1978

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STRS (7-8)CH	CWT.	0.98	7.88	66.400	523.23	512.77
TOTAL RECEIPTS						512.77

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
S.G. PASTURE	AUMS	3.01	1.00	3.010	18.00	54.18
BERMUDA HAY	TONS	0.20	1.00	0.200	37.50	7.50
SALT & MIN.	LBS.	12.71	1.00	12.710	0.08	1.02
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	12.63	1.00	12.630	0.25	3.16
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	2.05	1.00	2.050	14.00	28.70
MACH. FUEL & LUBE						2.39
MACHINERY REPAIR COST						1.30
EQUIPMENT REPAIR						0.28
TOTAL OPERATING COST						467.40
RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT						45.37

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	235.440	23.54
MACHINERY INVESTMENT	0.100	9.311	0.93
EQUIPMENT INVESTMENT	0.100	7.050	0.70
TOTAL INTEREST CHARGE			25.18
RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT			20.19

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	1.56
EQUIPMENT	DOL.	1.60
TOTAL OWNERSHIP COST		3.16
RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT		17.03

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.536	4.61
EQUIPMENT LABOR	3.000	0.250	0.75
LIVESTOCK LABOR	3.000	1.400	4.20
TOTAL LABOR COST		3.186	9.56
RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT			7.47

STOCKER ADG 1.16 LB; O.S. BERMUDA ADG 2.39 LB MADER
EST. COST OF O.S. BERMUDA IS ON CUSTOM BASIS
COSTS ARE PRORATED BY AUM UNITS OVER A 2 MO. PERIOD 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 2 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 5

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WHEAT PASTURE STOCKER TO 637 LB. 140 DAYS
GRAZE O.S. BERMUDAGRASS 63 DAYS (MAR 29 TO MAY 31)
AD LIB FINISH COMM. FEEDLOT 85 DAYS (MAY 31 TO AUG 24, 1978)

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.58	10.45	57.800	604.01	591.93
TOTAL RECEIPTS						591.93

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV (4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
S.G. PASTURE	AUMS	3.01	1.00	3.010	18.00	54.18
BERMUDA HAY	TONS	0.20	1.00	0.200	37.50	7.50
SALT & MIN.	LBS.	12.71	1.00	12.710	0.08	1.02
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	23.08	1.00	23.080	0.25	5.77
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	2.05	1.00	2.050	14.00	28.70
C.S. HULLS	CWT.	430.13	0.01	4.301	3.25	13.98
CORN	CWT.	1528.88	0.01	15.289	4.29	65.59
S.B. MEAL	CWT.	280.88	0.01	2.809	8.50	23.87
SUPPLEMENT	CWT.	117.63	0.01	1.176	4.29	5.05
FEED MARGIN	DAYS	85.00	1.00	85.000	0.15	12.75
FEEDLOT CHARGE	DAYS	85.00	1.00	85.000	0.05	4.25
MACH. FUEL & LUBE						2.39
MACHINERY REPAIR COST						1.30
EQUIPMENT REPAIR						0.28
TOTAL OPERATING COST						595.50

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-3.57

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	362.843	36.28
MACHINERY INVESTMENT	0.100	9.311	0.93
EQUIPMENT INVESTMENT	0.100	7.050	0.70
TOTAL INTEREST CHARGE			37.92

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-41.49

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	1.56
EQUIPMENT	DOL.	1.60
TOTAL OWNERSHIP COST		3.16

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-44.65

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.536	4.61
EQUIPMENT LABOR	3.000	0.250	0.75
LIVESTOCK LABOR	3.000	1.400	4.20
TOTAL LABOR COST		3.186	9.56

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-54.21

STOCKER ADG 1.16 LB MADER
O.S. BERMUDA ADG 2.39 LB
FEEDLOT ADG 3.03 LB 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 3 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 8

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WHEAT PASTURE STOCKER TO 637 LB, 140 DAYS
GRAZE SMALL GRAINS O.S. BERMUDA, 180 DAYS
MAR. 29 TO SEPT. 25, 1978

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STRS (9)	CWT.	0.98	9.01	56.400	508.16	498.00
TOTAL RECEIPTS						498.00

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
S.G. PASTURE	AUMS	3.01	1.00	3.010	18.00	54.18
BERMUDA HAY	TONS	0.20	1.00	0.200	37.50	7.50
SALT & MIN.	LBS.	20.09	1.00	20.090	0.08	1.61
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	4.00	1.00	4.000	5.00	20.00
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	13.76	1.00	13.760	0.25	3.44
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	2.05	1.00	2.050	14.00	28.70
MACH. FUEL & LUBE						3.59
MACHINERY REPAIR COST						1.94
EQUIPMENT REPAIR						0.28
TOTAL OPERATING COST						488.87

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	9.13

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	392.177	39.22
MACHINERY INVESTMENT	0.100	13.966	1.40
EQUIPMENT INVESTMENT	0.100	7.050	0.70
TOTAL INTEREST CHARGE			41.32

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-32.19

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.33
EQUIPMENT	DOL.	1.60
TOTAL OWNERSHIP COST		3.94

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-36.12

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	2.304	6.91
EQUIPMENT LABOR	3.000	0.250	0.75
LIVESTOCK LABOR	3.000	2.040	6.12
TOTAL LABOR COST		4.594	13.78

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-49.91

ADG: STOCKER, 1.16 LB MADER
ADG: 1ST 63 DAYS GRAZING, 2.39 LB
ADG: ENTIRE 180 DAYS, 1.46 LB 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 5 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 9

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WHEAT PASTURE STOCKER TO 637 LB (140 DAYS)
FED GRAIN AD LIB ON GRASS TO FINISH
MAR. 29 TO JULY 15, 1978-108 DAYS

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.98	9.49	58.400	554.22	543.13
BERMUDA HAY	TONS	2.00	1.00	37.500	37.50	75.00
TOTAL RECEIPTS						618.13

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV (4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
S.G. PASTURE	AUMS	3.01	1.00	3.010	18.00	54.18
BERMUDA HAY	TONS	0.20	1.00	0.200	37.50	7.50
SALT & MIN.	LBS.	8.83	1.00	8.830	0.08	0.71
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	1.75	1.00	1.750	5.00	8.75
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	14.24	1.00	14.240	0.25	3.56
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. BERMUDA	AUMS	2.00	1.00	2.000	14.00	28.00
C.S. HULLS	CWT.	437.64	0.01	4.376	3.25	14.22
CORN	CWT.	1577.13	0.01	15.771	4.29	67.66
S.B. MEAL	CWT.	288.38	0.01	2.884	8.50	24.51
SUPPLEMENT	CWT.	121.39	0.01	1.214	4.29	5.21
FEED PROCESSING	TONS	121.39	0.01	1.214	2.00	2.43
FEED DELIVERY	TONS	121.39	0.01	1.214	2.00	2.43
FEED MARKUP	TONS	121.39	0.01	1.214	7.50	9.10
CUST HAY REMOVAL	TONS	2.00	1.00	2.000	22.50	45.00
MACH. FUEL & LUBE						5.83
MACHINERY REPAIR COST						2.05
EQUIPMENT REPAIR						0.75
TOTAL OPERATING COST						649.52

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-31.38

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	330.937	33.09
MACHINERY INVESTMENT	0.100	21.743	2.17
EQUIPMENT INVESTMENT	0.100	17.825	1.78
TOTAL INTEREST CHARGE			37.05

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-68.43

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	3.83
EQUIPMENT	DOL.	3.35
TOTAL OWNERSHIP COST		7.19

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-75.62

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	2.772	8.32
EQUIPMENT LABOR	3.000	0.370	1.11
LIVESTOCK LABOR	3.000	2.430	7.29
TOTAL LABOR COST		5.572	16.72

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-92.34

STOCKER ADG 1.16 LB.-FINISH ADG 2.89 LB. MADER
EST. COST OF O.S. BERMUDA IS ON CUSTOM BASIS
THESE COSTS ARE PRORATED BY AUM UNITS OVER 2 MO. PERIOD 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 2 MACH. COMP. 12 IND. NUMBER 2 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 7

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WHEAT PASTURE STOCKER TO 637 LB, 140 DAYS
AD LIB FINISH COMMERCIAL FEEDLOT
MAR. 29 TO JUNE 26, 1978-89 DAYS

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.98	9.63	58.000	558.54	547.37
TOTAL RECEIPTS						547.37

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV (4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
S.G. PASTURE	AUMS	3.01	1.00	3.010	18.00	54.18
BERMUDA HAY	TONS	0.20	1.00	0.200	37.50	7.50
SALT & MIN.	LBS.	8.83	1.00	8.830	0.08	0.71
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	20.75	1.00	20.750	0.25	5.19
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. HULLS	CWT.	460.38	0.01	4.604	3.25	14.96
CORN	CWT.	1652.00	0.01	16.520	4.29	70.87
S.B. MEAL	CWT.	302.13	0.01	3.021	8.50	25.68
SUPPLEMENT	CWT.	126.88	0.01	1.269	4.29	5.44
FEED MARGIN	DAYS	89.00	1.00	89.000	0.15	13.35
FEEDLOT CHARGE	DAYS	89.00	1.00	89.000	0.05	4.45
MACH. FUEL & LUBE						1.79
MACHINERY REPAIR COST						0.97
EQUIPMENT REPAIR						0.28
TOTAL OPERATING COST						574.26

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-26.89

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	282.277	28.23
MACHINERY INVESTMENT	0.100	6.983	0.70
EQUIPMENT INVESTMENT	0.100	7.050	0.70
TOTAL INTEREST CHARGE			29.63

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-56.52

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	1.17
EQUIPMENT	DOL.	1.60
TOTAL OWNERSHIP COST		2.77

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-59.29

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.152	3.46
EQUIPMENT LABOR	3.000	0.250	0.75
LIVESTOCK LABOR	3.000	1.080	3.24
TOTAL LABOR COST		2.482	7.45

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-66.73

ADG STOCKER, 1.16 LB
ADG FEEDLOT, 3.67 LB

MADER

02/21/79

ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 4 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 6

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BERMUDAGRASS HAY STOCKERS - NOV. 9 TO MAR. 29, 1978
BUY 475 - SELL 530 - 2% DEATH LOSS
STOCKER BUDGET - PER CALF - 100 UNIT

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.98	5.30	73.500	389.55	381.76
TOTAL RECEIPTS						381.76

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV (4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
BERMUDA HAY	TONS	1.14	1.00	1.138	37.50	42.67
SALT & MIN.	LBS.	8.83	1.00	8.830	0.08	0.71
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	10.05	1.00	10.050	0.25	2.51
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
MACH. FUEL & LUBE						3.47
MACHINERY REPAIR COST						0.92
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						420.10

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-38.34

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	159.947	15.99
MACHINERY INVESTMENT	0.100	12.683	1.27
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			19.92

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-58.26

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.29
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		5.99

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-64.25

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.392	4.18
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	1.080	3.24
TOTAL LABOR COST		2.651	7.95

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-72.20

STEER BUYING & SELLING PRICE - 10 YR. SEASONALLY ADJUSTED AVERAGE MADER
140 DAY ADG, .39 LB.

02/21/79

ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 0 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 3

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BERMUDAGRASS HAY STOCKER, 140 DAYS
GRAZE OVERSEEDED BERMUDAGRASS, 63 DAYS
PAR. 29 TC MAY 31, 1978

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STRS (6-7)CH	CWT.	0.98	6.44	70.500	454.02	444.94
TOTAL RECEIPTS						444.94

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
BERMUDA HAY	TONS	1.14	1.00	1.138	37.50	42.67
SALT & MIN.	LBS.	12.71	1.00	12.710	0.08	1.02
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	11.19	1.00	11.190	0.25	2.80
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	1.44	1.00	1.440	14.00	20.16
MACH. FUEL & LUBE						4.07
MACHINERY REPAIR COST						1.25
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						441.78

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	3.16

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	230.126	23.01
MACHINERY INVESTMENT	0.100	15.010	1.50
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			27.17

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-24.01

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.68
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		6.38

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-30.38

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.776	5.33
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	1.400	4.20
TOTAL LABOR COST		3.355	10.06

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-40.45

STOCKER ADG .39 LB, O.S. BERMUDA ADG 1.81 LB MADER
EST. COST OF O.S. BERMUDA IS ON CUSTOM BASIS
COSTS ARE PRORATED BY AUM UNITS OVER A 2 MO. PERIOD 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 7 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 5
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BERMUDAGRASS HAY STOCKER TO 530 LB. 140 DAYS
GRAZE O.S. BERMUDA 63 DAYS (MAR 29 TO MAY 31)
AD LIB FINISH COMM. FEEDLOT 117 DAYS (MAY 31 TO SEPT 25, 1978)

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.98	10.09	54.600	550.91	539.90
TOTAL RECEIPTS						539.90

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
BERMUDA HAY	TONS	1.14	1.00	1.138	37.50	42.67
SALT & MIN.	LBS.	12.71	1.00	12.710	0.08	1.02
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	21.28	1.00	21.280	0.25	5.32
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	1.44	1.00	1.440	14.00	20.16
C.S. HULLS	CWT.	534.25	0.01	5.343	3.25	17.36
CORN	CWT.	2017.88	0.01	20.179	4.29	86.57
S.B. MEAL	CWT.	361.75	0.01	3.618	8.50	30.75
SUPPLEMENT	CWT.	153.25	0.01	1.532	4.29	6.57
FEED MARGIN	DAYS	117.00	1.00	117.000	0.15	17.55
FEEDLOT CHARGE	DAYS	117.00	1.00	117.000	0.05	5.85
MACH. FUEL & LUBE						4.07
MACHINERY REPAIR COST						1.25
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						608.95

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-69.06

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	398.246	39.82
MACHINERY INVESTMENT	0.100	15.010	1.50
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			43.98

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-113.04

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.68
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		6.38

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-119.41

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.776	5.33
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	1.400	4.20
TOTAL LABOR COST		3.355	10.06

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-129.48

ADG: STOCKER, .39 LB MADER
ADG: O.S. BERMUDA 1.81 LB
ADG: FEEDLOT 3.12 LB 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 8 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 9

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BERMUDAGRASS HAY STCCKER, 140 DAYS
GRAZE SMALL GRAINS O.S. BERMUDA, 180 DAYS
MAR. 29 TO SEPT. 25, 1978

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
STRS (8)	CWT.	0.98	8.02	61.800	495.64	485.72
TOTAL RECEIPTS						485.72

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
BERMUDA HAY	TONS	1.14	1.00	1.138	37.50	42.67
SALT & MIN.	LBS.	20.09	1.00	20.090	0.08	1.61
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	3.60	1.00	3.600	5.00	18.00
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	12.77	1.00	12.770	0.25	3.19
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	1.44	1.00	1.440	14.00	20.16
MACH. FUEL & LUBE						5.26
MACHINERY REPAIR COST						1.90
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						461.36

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	24.36

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	378.083	37.81
MACHINERY INVESTMENT	0.100	19.666	1.97
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			42.43

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-18.06

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	3.46
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		7.16

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-25.22

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	2.544	7.63
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	2.040	6.12
TOTAL LABOR COST		4.763	14.29

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-39.51

ADG: STOCKER, .39 LB MADER
ADG: 1ST 63 DAYS GRAZING, 1.81 LB
ADG: ENTIRE 180 DAYS, 1.46 LB 02/21/79
ENTERPRISE 14 AREA AND COUNTY 23 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 6 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 9
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BERMUDAGRASS HAY STOCKER 140 DAYS
FED GRAIN AD LIB ON GRASS TO FINISH, 166 DAYS
MAR. 29 TO SEPT. 11, 1978

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.98	9.81	56.400	553.28	542.22
BERMUDA HAY	TONS	2.00	1.00	37.500	37.50	75.00
TOTAL RECEIPTS						617.22

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
BERMUDA HAY	TONS	1.14	1.00	1.138	37.50	42.67
SALT & MIN.	LBS.	8.83	1.00	8.830	0.08	0.71
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	3.50	1.00	3.500	5.00	17.50
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	14.56	1.00	14.560	0.25	3.64
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
O.S. BERMUDA	AUMS	1.40	1.00	1.400	14.00	19.60
C.S. HULLS	CWT.	597.14	0.01	5.971	3.25	19.41
CORN	CWT.	2415.64	0.01	24.156	4.29	103.63
S.B. MEAL	CWT.	473.77	0.01	4.738	8.50	40.27
SUPPLEMENT	CWT.	183.38	0.01	1.834	4.29	7.87
FEED PROCESSING	TONS	183.35	0.01	1.833	2.00	3.67
FEED DELIVERY	TONS	183.35	0.01	1.833	2.00	3.67
FEED MARKUP	TONS	183.35	0.01	1.833	7.50	13.75
CUST HAY REMOVAL	TONS	2.00	1.00	2.000	22.50	45.00
MACH. FUEL & LUBE						9.57
MACHINERY REPAIR COST						2.55
EQUIPMENT REPAIR						1.41
TOTAL OPERATING COST						702.53

RETURNS TO LAND, LABOR, CAPITAL, MACHINERY, OVERHEAD, RISK, AND MANAGEMENT	-85.32

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	418.738	41.87
MACHINERY INVESTMENT	0.100	34.987	3.50
EQUIPMENT INVESTMENT	0.100	37.296	3.73
TOTAL INTEREST CHARGE			49.10

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-134.42

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	6.32
EQUIPMENT	DOL.	5.45
TOTAL OWNERSHIP COST		11.77

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-146.19

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	3.840	11.52
EQUIPMENT LABOR	3.000	0.299	0.90
LIVESTOCK LABOR	3.000	3.120	9.36
TOTAL LABOR COST		7.259	21.78

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-167.96

STOCKER ADG .39 LB.-FINISH ADG 2.72 LB. MADER
EST. COST OF O.S. BERMUDA IS ON CUSTOM BASIS
THESE COSTS ARE PRORATED BY AUM UNITS OVER 2 MO. PERIOD 02/21/79
ENTERPRISE 14 AREA AND COUNTY 29 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 2 MACH. COMP. 12 IND. NUMBER 4 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 9

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BERMUDAGRASS HAY STOCKER TO 530 LB. 140 DAYS
AD LIB FINISH COMMERCIAL FEEDLOT
MAR. 29 TO AUG. 24, 1978-148 DAYS

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.58	9.98	57.800	576.84	565.31
TOTAL RECEIPTS						565.31

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
BERMUDA HAY	TONS	1.14	1.00	1.138	37.50	42.67
SALT & MIN.	LBS.	8.83	1.00	8.830	0.08	0.71
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.02	2.02
TRUCKING	CWT.	20.03	1.00	20.030	0.25	5.01
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. HULLS	CWT.	683.76	0.01	6.838	3.25	22.22
CORN	CWT.	2520.76	0.01	25.208	4.29	108.14
S.B. MEAL	CWT.	628.51	0.01	6.285	8.50	53.42
SUPPLEMENT	CWT.	202.01	0.01	2.020	4.29	8.67
FEED MARGIN	DAYS	148.00	1.00	148.000	0.15	22.20
FEEDLOT CHARGE	DAYS	148.00	1.00	148.000	0.05	7.40
MACH. FUEL & LUBE						3.47
MACHINERY REPAIR COST						0.92
EQUIPMENT REPAIR						0.94
TOTAL OPERATING COST						644.65

RETURNS TO LAND, LABOR, CAPITAL, MACHINERY, OVERHEAD, RISK, AND MANAGEMENT	-79.34

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	372.793	37.28
MACHINERY INVESTMENT	0.100	12.683	1.27
EQUIPMENT INVESTMENT	0.100	26.521	2.65
TOTAL INTEREST CHARGE			41.20

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-120.54

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	2.29
EQUIPMENT	DOL.	3.70
TOTAL OWNERSHIP COST		5.99

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-126.53

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	1.392	4.18
EQUIPMENT LABOR	3.000	0.179	0.54
LIVESTOCK LABOR	3.000	1.080	3.24
TOTAL LABOR COST		2.651	7.95

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-134.48

ADG: STOCKER, .39 LB
ADG: FEEDLOT, 3.16 LB

MADER

02/21/79

ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 9 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 8

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CHOICE SLAUGHTER STEERS (HXA)
BUY-475 LB, SELL-958 LB, 1% DEATH LOSS
COMMERCIAL FEEDLOT FACILITIES UTILIZED

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.99	9.58	57.000	546.06	540.60
TOTAL RECEIPTS						540.60

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.25	2.25
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TRUCKING	CWT.	19.08	1.00	19.080	0.25	4.77
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. HULLS	CWT.	299.51	0.01	2.995	3.25	9.73
WHOLE CORN	CWT.	2884.79	0.01	28.848	4.29	123.76
60% + PRO. SUP.	CWT.	255.08	0.01	2.551	7.88	20.10
FEED MARGIN	DAYS	194.00	1.00	194.000	0.15	29.10
FEEDLOT CHARGE	DAYS	194.00	1.00	194.000	0.05	9.70
MACH. FUEL & LUBE						0.39
MACHINERY REPAIR COST						0.21
EQUIPMENT REPAIR						0.03
TOTAL OPERATING COST						566.91

RETURNS TO LAND, LABOR, CAPITAL, MACHINERY, OVERHEAD, RISK, AND MANAGEMENT	-26.31

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	262.531	26.25
MACHINERY INVESTMENT	0.100	1.528	0.15
EQUIPMENT INVESTMENT	0.100	0.400	0.04
TOTAL INTEREST CHARGE			26.45

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-52.75

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	0.26
EQUIPMENT	DOL.	0.17
TOTAL OWNERSHIP COST		0.42

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-53.17

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	0.252	0.76
EQUIPMENT LABOR	3.000	0.010	0.03
LIVESTOCK LABOR	3.000	0.300	0.90
TOTAL LABOR COST		0.562	1.69

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-54.86

FED NOV. 9 TO MAY 22, 1978 (194 DAYS) MADER
FEEDLOT ADG 2.49 LB
WHOLE CORN-COTTONSEED HULL RATION 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 3 MACH. COMP. 12 IND. NUMBER 1 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 5

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CHOICE SLAUGHTER STEERS (HXA)
BUY - 475 LB., SELL - 958 LB., 1% DEATH LOSS
OWNER FEEDLOT FACILITIES UTILIZED

PRODUCTION	UNITS	QUANITY	WEIGHT	PRICE	VALUE/UNIT	VALUE
SLTR STRS	CWT.	0.99	9.58	57.000	546.06	540.60
TOTAL RECEIPTS						540.60

OPERATING INPUTS	UNITS	RATE PER UNIT	NUMBER OF UNITS	TOTAL UNITS	PRICE	VALUE
STR CALV(4-5)CH	CWT.	1.00	4.75	4.750	74.90	355.77
STARTER FEED	CWT.	0.42	1.00	0.420	7.10	2.98
NATIVE PASTURE	AUMS	0.25	1.00	0.250	5.00	1.25
VET & MED.	HD.	1.00	1.00	1.000	2.25	2.25
ORDER BUYER COST	HD.	1.00	1.00	1.000	1.60	1.60
SALES COMM.	HD.	1.00	1.00	1.000	3.00	3.00
TRUCKING	CWT.	14.33	1.00	14.330	0.25	3.58
TAXES	HD.	1.00	1.00	1.000	2.25	2.25
C.S. HULLS	CWT.	291.98	0.01	2.920	3.25	9.49
WHOLE CORN	CWT.	2884.79	0.01	28.848	4.29	123.76
60% + PRO. SUP.	CWT.	247.55	0.01	2.476	7.88	19.51
FEED MARKUP	TONS	171.36	0.01	1.714	7.50	12.85
FEED PROCESSING	TONS	171.96	0.01	1.720	2.00	3.44
FEED DELIVERY	TONS	171.87	0.01	1.719	2.00	3.44
MACH. FUEL & LUBE						6.40
MACHINERY REPAIR COST						1.70
EQUIPMENT REPAIR						0.70
TOTAL OPERATING COST						553.97

RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT	-13.37

CAPITAL COST	PRICE	AMOUNT	VALUE
ANNUAL OPERATING CAPITAL	0.100	258.884	25.89
MACHINERY INVESTMENT	0.100	23.397	2.34
EQUIPMENT INVESTMENT	0.100	16.975	1.70
TOTAL INTEREST CHARGE			29.93

RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT	-43.30

OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)		
MACHINERY	DOL.	4.23
EQUIPMENT	DOL.	2.98
TOTAL OWNERSHIP COST		7.20

RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT	-50.50

LABOR COSTS	PRICE	HOURS	
MACHINERY LABOR	3.000	2.568	7.70
EQUIPMENT LABOR	3.000	0.147	0.44
LIVESTOCK LABOR	3.000	2.210	6.63
TOTAL LABOR COST		4.925	14.78

RETURNS TO LAND, OVERHEAD RISK AND MANAGEMENT	-65.28

FED NOV. 9 TO MAY 22, 1978 (194 DAYS) MADER
FEEDLOT ADG 2.49LB.
WHOLE CORN - COTTONSEED HULL RATION (TRUCK) 02/21/79
ENTERPRISE 14 AREA AND COUNTY 28 DETAIL 00 SPECIES 1 AGE & SEX 3
GRADE 2 MACH. COMP. 12 IND. NUMBER 7 PRICE VECT 2 EQUIP. COMP 12
ANNUAL CAPITAL MONTH: 5

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VITA[2]

Terry Lee Mader

Candidate for the Degree of

Master of Science

Thesis: CATTLE PERFORMANCE AND ECONOMIC POTENTIALS OF ALTERNATIVE STOCKER AND FINISHING PROGRAMS FOR FALL-WEANED CALVES

Major Field: Animal Science

Biographical:

Personal Data: Born in Quinter, Kansas, April 29, 1951 and married Sheila Kay Howell, August 16, 1975.

Education: Graduated from Jennings High School, Jennings, Kansas, in May 1969; received an Associate degree from Colby Community Junior College, Colby, Kansas, in May 1971; received the Bachelor of Science degree in Agriculture from Kansas State University, Manhattan, Kansas, in December, 1973, with a major in Feed Science and Management; completed the requirements for the Master of Science degree from Oklahoma State University, Stillwater, Oklahoma, in May 1979.

Professional Experience: Reared on a farm in northwestern Kansas; Feedmill trainee, Winterscheidt Milling Company, Seneca, Kansas, 1972; Feedlot hand, Hoxie Cattle Co., Hoxie, Kansas, 1973; Farm Manager, Platte Valley Products Inc., Lexington, Nebraska, 1974-1975; Shift Supervisor, Tabor Milling Co., Div. of Archer Daniels Midland Co., North Kansas City, Missouri, 1975-1976. Production Manager, Gooch Mill and Elevator, Div. of Archer Daniels Midland Co., North Kansas City, Missouri, 1976; Supervisor, Oklahoma State Forage Testing Laboratory, Stillwater, Oklahoma, 1976-1978; Graduate Assistant at Oklahoma State University, 1978-1979.

Professional Organizations: Phi Theta Kappa; Gamma Sigma Delta; Phi Kappa Phi; American Society of Animal Science.