B-1043

FEEDING THE COW AND CALF

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TEXAS AGRICULTURAL EXTENSION SERVICE
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contents

APPROXIMATELY 60 percent of the cost of producing a calf is in feeding the cow and calf. This major cost indicates the need for a better understanding of this part of the cow and calf enterprise.

Many cattlemen have developed an unusual ability to look at the grass in a pasture, estimate the stocking rate and the amount of supplemental feeding that will be necessary and predict the response of cattle over a 4 to 6 months period.

This publication attempts to identify many of the points which these cattlemen consider and some new points which should be included. It shows why certain amounts of feed are required for the producing cow and her calf, what causes changes in these requirements and factors affecting the feed efficiency of a ranching operation. Certain guidelines such as the amount of forage required per cow, minimum weights of cattle at different ages and acceptable weight changes, follow.

FEEDING THE COW AND CALF

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WHAT THE PASTURE PROVIDES

Many cattlemen consider the calf crop as the only crop produced on a ranch, but by the time the calf crop is ready to sell cattlemen have already produced and harvested or partially harvested a crop of grass. This forage crop has some of the same characteristics of a wheat, milo or cotton crop. It may be extremely good, an average or almost a failure. On one research station where the 8-year average of forage production was 1,053 pounds of dry matter per acre, the lowest production was 557 pounds and the highest was 1,488 pounds (2). See figure 1.

A rancher with cows and calves must have a year-round feed supply. Native pastures have seasonal growing periods of 180 to 300 days depending upon temperature and regularity of rainfall. Forage production where the growing season is 180 to 210 days, and rainfall averages 18 to 22 inches, will be similar to that illustrated in the upper section of figure 2. Here, grass starts to grow with the first warm weather in spring and continues to grow until frost except for set-backs by dry weather. There will be little or no production of forage during the winter season.

The lower section of figure 2 shows a forage production pattern where the growing season is 250 or more days and rainfall is 40 inches or more. Under such circumstances, forage growth begins in late winter and continues until hot dry weather arrives, usually in July. With cool weather and some moisture in September, a new growth of grass will begin and continues until frost.

One other growing pattern is typical of the southern and southwestern part of the State. This growing season is 250 days or more and rainfall is from 10 to 25 inches. Forage production responds to the limited rainfall and may appear as one long growing season during wet years or three or four short growing seasons during the normal or dry years.

If a cow could harvest all of the native forage produced and the forage remain healthy after nearly all of the plant had been removed, the num-

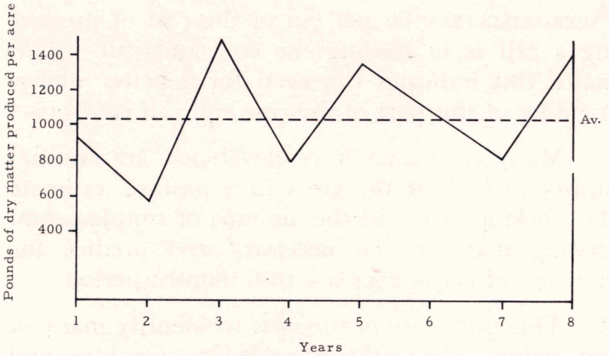

Figure 1. Variation in annual forage production (2).

ber of head of livestock on native ranges could increase by 40 to 50 percent. Since there is a direct relationship between the amount of forage left above ground and the vigor of the root system in native grasses, and since old grass left on a pasture increases water intake into the soil and decreases erosion, a part of the forage production must remain on the pasture at the end of the season. This part may amount to less than 20 percent on improved pastures in the southern and eastern parts of the State and 40 percent or more of the total grass produced in the western and northwestern sections.

Some loss of grass results from damage by rodents, insects, hail, pounding rains, decay and unknown causes. These losses, when expressed as percent of total forage production, may be as low as 10 percent in areas of high production under good forage management. In areas of low forage production, the loss may be to 25 or 30 percent. If the ranch is also supporting sheep, goats, deer and/or antelope the amount actually harvested by cows and calves is reduced proportionately.

Figure 3 shows a break-down of the disappearance of forages under different conditions. The information on native pastures was collected over an 8-year period on pastures that produced an average of 19,500 pounds of air-dry forage for each producing cow (2). Pastures stocked at this rate maintained reasonably high production levels. The cows produced an average 91 percent calf crop, weighing 480 pounds at 7 months of age.

The disappearance of forage from improved pastures in the eastern part of Texas forms a pattern similar to that shown in figure 5 as improved pastures. Since production per acre is much higher, only 10 or 15 percent of the forage production must be left to maintain healthy plants and only 10 or 15 percent is usually lost to some of the un-

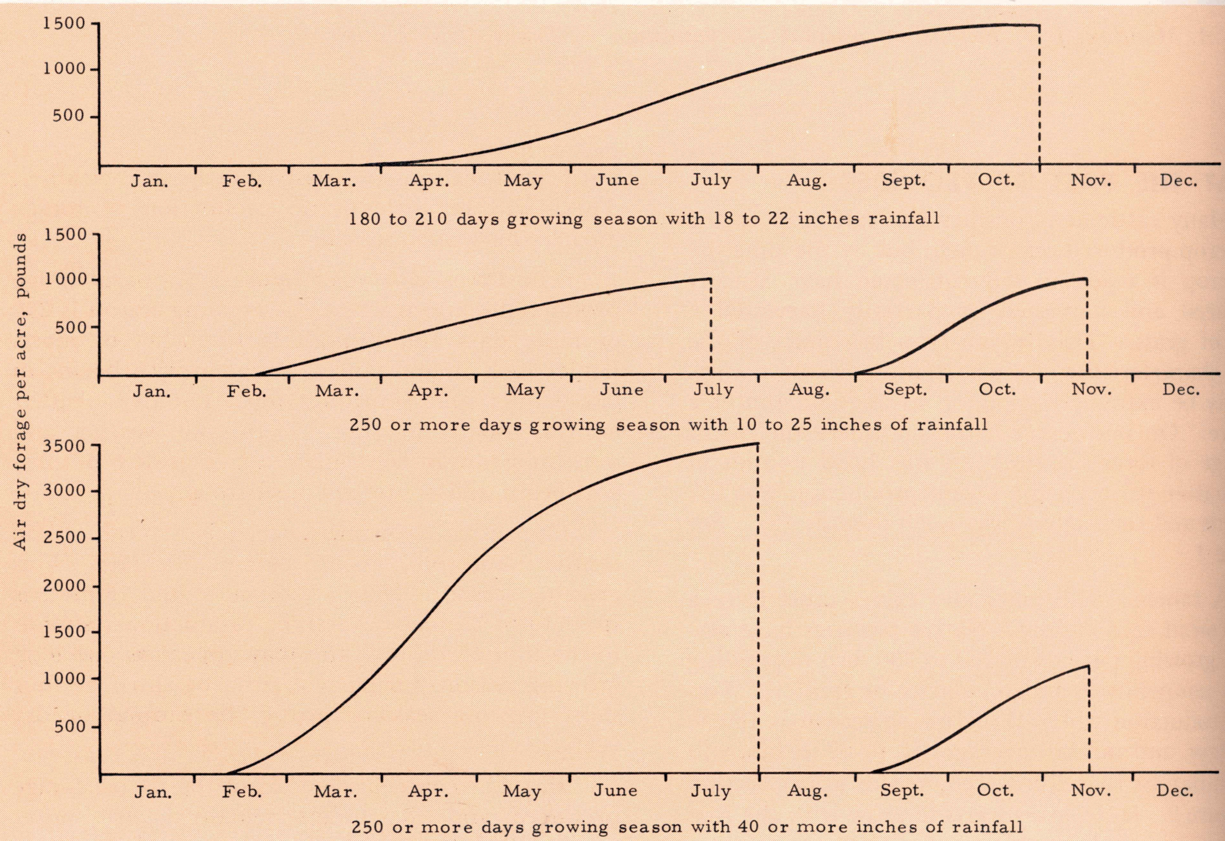

Figure 2. The accumulation of forage during growing periods.

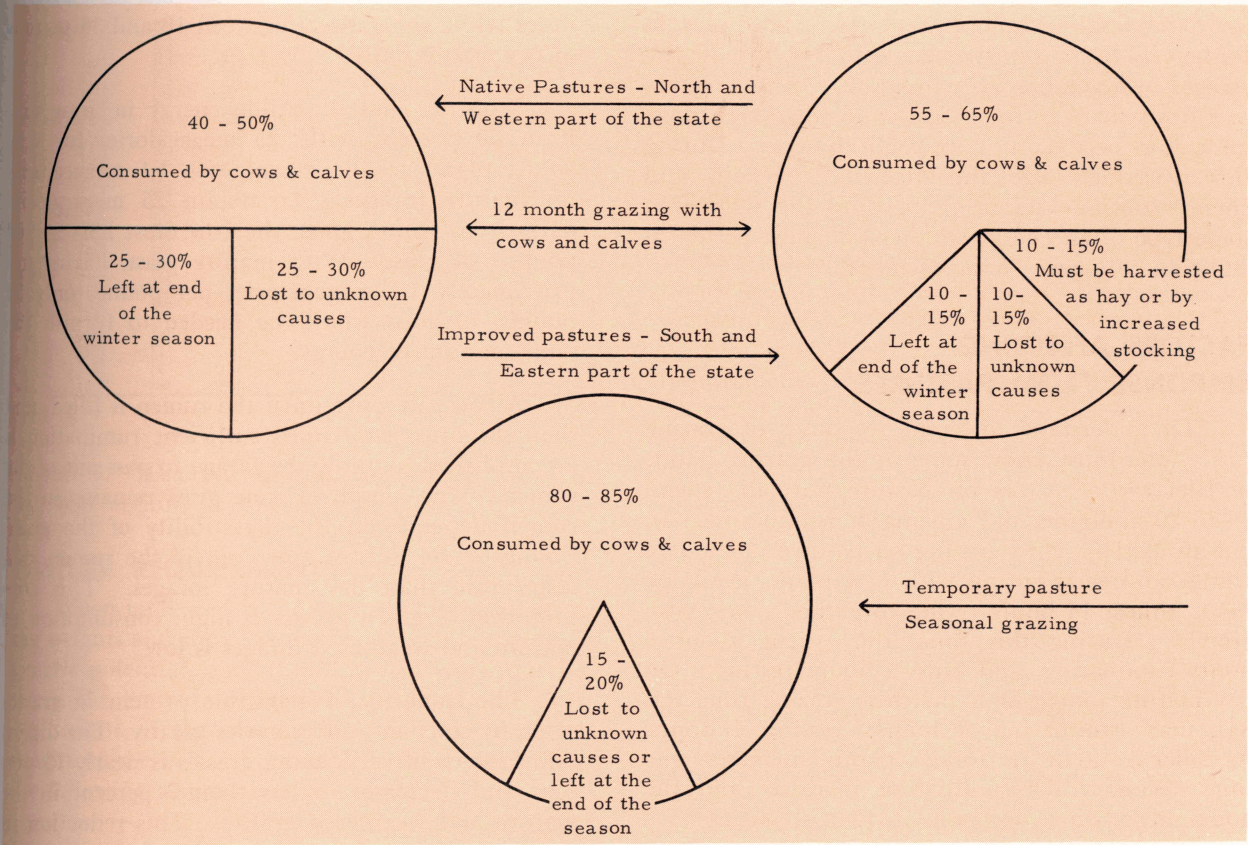

Figure 3. Disappearance of forage.

Figure 4. Average monthly trend in the composition of 11 warm season perennial grasses (5).

known causes. The cows and calves actually consume 55 or 65 percent of the forage in a 12-month grazing season, leaving 10 to 15 percent of the forage to be harvested as hay or by increasing the stocking rates during the growing season.

The use of temporary pastures such as Sudangrass to increase forage production on a farm or ranch is an excellent practice. When properly grazed, the cows and calves can eat 80 to 85 percent of the production. The rest is lost to rodents and insects and left at the end of the growing season.

Figure 4 shows the average monthly trend in the composition of 11 warm season perennial grasses over a 5-year period in the southern part of the Great Plains region (5). The amount of moisture shows the greatest variation due to season of the year with changes from 7.22 percent in March to 70.70 percent in April. The digestible protein, on an oven-dry basis, changes from 1.98 to 14.98 percent during the same period. The megacalories of energy also on an oven-dry basis change little during the year.

Pasture grasses in the 35 to 50-inch rainfall belt are 5 to 10 percent higher in moisture and correspondingly lower in energy. The protein content is lower on average soils, but can be increased by a good fertility program. In this region, pastures remain in the mature and weathered stage for a short period and then begin to decay. During this decaying stage the digestible protein and energy continues to be reduced to the stage that some type of an energy supplement must be fed in addition to a protein supplement.

FACTORS AFFECTING RESPONSE FROM PASTURES

To understand different responses of grazing cattle, one must know some of the grazing habits of beef cattle. Cows on pasture normally spend 16 to 20 hours per day grazing or ruminating. In one study, (6), cows grazing on pasture in the late winter and early spring with new plants available spent almost 14 hours trying to gather a new lush growth. During this time, they spent about 6 hours ruminating, and only 3 hours resting. On dry mature forage high in fiber, grazing time was 8 hours; ruminating, 9 hours; resting 4 hours. As fiber content in forage plants increases, the time necessary for ruminating increases and the hours of grazing decrease.

Beef cattle have two primary grazing periods. The first begins about daylight and continues for 3 or more hours. The second begins late in the afternoon and continues until after dark.

Two secondary grazing periods vary with the season of the year, forage condition, weather and watering facilities. One begins about midnight and continues for about an hour. The other is during mid-day with several short grazing periods for a total of 1 to 3 hours. The period from about 2 a.m. until just before dawn usually is free of grazing activities.

Nursing activity occurs at all hours of the day and night, but mostly after 5 and 6 a.m. Other peaks are at mid-day, about dusk and around midnight. Overall nursing time for all animals averages 49 minutes a day, ranging from 16 to 115 minutes (6).

Some of the inefficiency of a beef cow in harvesting grass can be attributed to her lower front teeth of 2½ to 3 inches total width. Grazing actually amounts to nothing but breaking off the grass after the cow clamps it between her teeth and upper gums. Grazing work increases as the grass becomes more mature. The cow also must move about 1,000 pounds of body weight 1 or more miles while she gathers between 10 and 30 pounds of dry matter daily.

Moisture and digestible energy in grass vary from 80 percent with .25 megacalories for very young plants to 10 percent with 1.1 megacalories for mature forages. To obtain 25 megacalories daily from young grass, the cow must harvest 100 pounds of grass. With mature grass, having approximately 1.1 megacalories per pound, only 23 pounds of grass would be needed to furnish the same amount of energy.

A cow can graze until the rumen is filled, and then she must stop until sufficient rumination is accomplished to allow the forage to pass out of the rumen. The length of time grass remains in the rumen depends on the digestibility of the grass. Young tender grasses move out of the rumen at a faster rate than dry mature forages. This consumption of green grasses is high; consumption of mature and weathered forages is low.

The quantity of digestible protein in grasses eaten by cows and calves varies greatly. The digestible protein in very young grasses is nearly 15 percent and decreases to less than 2 percent in the mature and weathered grasses. This reduction in percent protein along with reduced forage available, results in protein shortage during the winter season. The megacalories of digestible energy in the air-dry forage change little during the different seasons. Large changes in the amount of forage available may cause a shortage of energy during the winter season.

Many factors affect the appetite of cattle. One is the level of protein in the ration. Since feedlot cattle on a ration low in protein have low feed consumption, so it is that cows wintered on an abundance of mature weathered forage may not consume enough forage to maintain body weight because of the lowered appetite for the same reason. This supports the observation of cattlemen that cows fed a high protein supplement will consume more mature and weathered grasses than non-supplemented cows.

The difference in the amount and kind of forage available during the growing season has a direct relationship to weaning weight. Cows nursing calves during the period of high forage production produce the heaviest calves at weaning time. The months with high weaning weights shown in figure 5 (3) do not indicate the proper calving season in all areas of the State, a calving period of 3 to 5 months on each farm or ranch allows the highest production per cow.

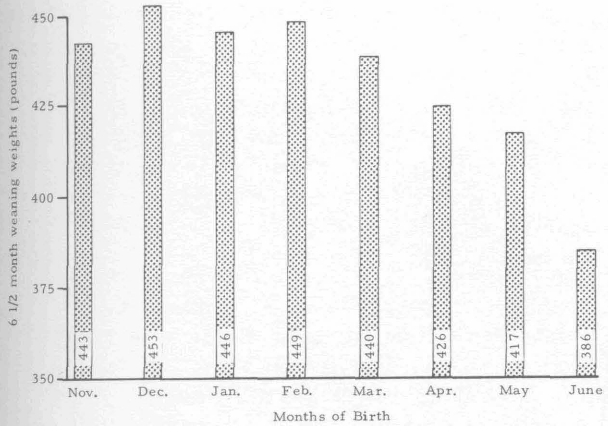

Figure 5. Weaning weights of calves born in different months at Lufkin (3).

PASTURE REQUIREMENTS

When total feed is the limiting factor in weaning weights and the cows are producing below their genetic potential, a relationship can work out between the amount of energy consumed, the average weight of the mature cow and the weaning weight of the calf. To establish these guidelines, the following assumptions are made:

(1) That calves are born in approximately a 90-day period just prior to the season when forage is most abundant.

(2) That all cows and calves are reasonably healthy and free from parasites.

(3) That the calves are weaned at about 7 months of age.

Figure 6 shows calculated digestible energy requirements which can be read by using a straight edge and placing the right side on the average weight of the mother cows and the left side on the average weaning weight of the calves. The figure on the center line that is crossed by the straight edge is the approximate megacalories of energy required by the cow and calf.

Using the estimated annual digestible energy requirements from figure 6, pasture requirements can be established. Table 1 shows how to estimate stocking rates when the principal feed is native forage. The pounds of energy in the protein supplement and hay usually fed in the winter should be subtracted from the estimated annual energy requirements. Since most pasture grasses contain 0.9 to 1.1 megacalories of energy per pound on an air-dry basis, the pounds of air-dry pasture forage should equal the megacalories of energy required for each cow and calf. In the western section of Texas, the cow and calf should consume only 40 to 50 percent of the forage produced. In the example in Table 1, total pounds of air-dry forage divided by the percentage used by the cow and calf gives the total pounds of air-dry forage required per breeding cow. When the pounds of forage total per breeding cow is divided by the average production per acre, the result is the number of acres needed for each producing cow.

When estimating stocking rates in the eastern and southeastern sections of the State, the pounds of energy furnished by hay shown on line 2 of Table 1 will be much larger than the example. The percentage of forage used by the cow and calf also will increase when cows are grazing on more productive improved pasture. The percentage of the forage used by the cows and calves on line 6 should average about 60 percent.

If production level is lower than that shown in the example in Table 1, the percentage of forage used by your cows and calves is probably great-

Table 1. Estimating stocking rates

			Example	Your herd
1*	Energy requirement for cow and calf (1,000 lb. cow—500 lb. calf)		8,817	
2**	Minus energy in supplemental feed			
	(300 lb. CSC 1.3 megacalorie)	390		
	(150 lb. hay 0.9 megacalorie)	135		
		525	−525	
3	Energy needed from pasture forage		8,292	
4	Megacalorie per pound of forage		÷1.0	
5	Total pounds of air-dry forage required for each cow and calf		8,292	
6	40 to 65% of the forage used by cow and calf (40 to 50% for western native pastures) (55 to 65% for eastern improved pastures)		÷.40	
7	Total pounds of air-dry forage required per cow		20,730	
8	Pounds of air-dry forage produced per acre		1,300	
9	Number of acres per cow and calf		16	

*Use your average cow weight and 7 month calf weight and determine the TDN requirements from figure 6.
**Use your planned supplemental feeding program to calculate this figure. If grain is fed, use 1.60 megacalories for this fraction.

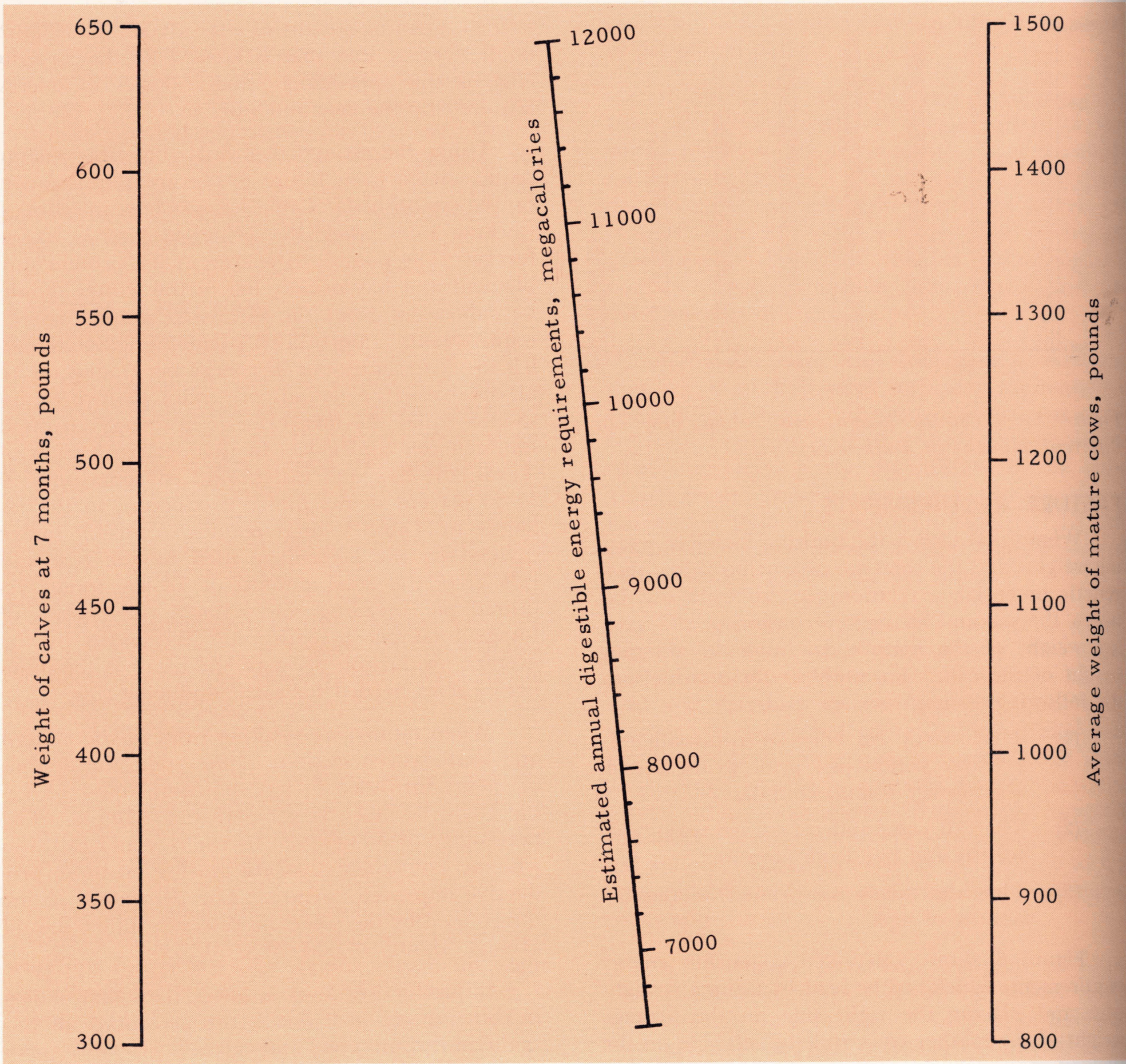

Figure 6. Estimating annual digestible energy requirements for a cow and her calf (2 miles travel).

er than that suggested in the example. If production levels are below those in the example, pastures probably are being over-grazed.

With the wide variation in forage production, the rancher should think in terms of pounds of air-dry forage required per cow instead of number of acres per cow. Figure 7 shows the response in terms of production from two different stocking rates. (2). These stocking rates are shown as forage production per cow at the average rate of 12,000 pounds and 19,500 pounds. In this particular experiment, the stocking rate was 12 and 17 acres per cow. In some areas, 6 and 8.5 acres may be required to produce a similar amount of forage. In the extremely dry sections of the state 24 and 34 acres might be comparable to these production figures.

In figure 7, where the level of forage production ranges from 12,000 pounds for 12 acres to 19,500 pounds for 17 acres, there is shown a substantial increase in five of the six criteria suggested to measure production. But the sixth criteria, pounds of calf produced per acre, shows a slight decrease.

The changes in average weight of breeding cows and average birth dates of calves are small and have little effect on overall efficiency. The changes in percentage calf crop and average weaning weight are large and have a substantial effect on profit or loss in any cow and calf operation. This can best be visualized in pounds of calf weaned per cow. Where dams with low forage production per cow weaned only 327 pounds of calf, the group with high forage production per cow weaned 443 pounds of calf. Pounds of calf produced per acre are about equal but the average profit per acre is in favor of the lighter stocking rate.

Production levels used to indicate stocking rates show that most Texas ranches are stocked somewhere between the low and high level shown in figure 7. Thus it is evident that a reduction in cattle numbers from 15 to 20 percent would be profitable on many ranches.

FEED EFFICIENCY

Feed efficiency in a cow and calf operation means the number of pounds of forage or energy required to produce 100 pounds of calf at approximately 7 months of age. This figure can determine the efficiency of the overall operation just as the number of pounds of feed required per 100 pounds gain is used in feedlot operations. Feed efficiency cannot be measured on grazing cattle as it is measured in the feedlot, but basic causes of efficiency can be identified and will indicate well or poorly managed operations.

The four major causes of differences in feed efficiency are *average weight of mature cows, weaning weight of the calves, percentage calf crop weaned and length of productive life of the cows.*

The feed required for maintenance increases as weights of the cows increase. Figure 8 shows in a graphic form this and other major causes of changes in efficiency. The energy required to produce 100 pounds of calf will decline if the calf weight remains the same and the average mature weight of the cow herd declines. Feed efficiency increases as weaning weights increase when the average mature weight of the cow herd remains the same. The increase in feed efficiency demonstrates the importance of a high percentage calf crop. The length of productive life shows that feed efficiency changes rapidly during the first three or four calves and tends to level out if the cows stay in production for six or eight calves. Figure 9 indicates the real saving in feed is when replacement heifers are selected that can stay in production for a long time over those that are culled after producing the first or second calf.

When considering the total efficiency of young cattle that are slaughtered after a period of time in

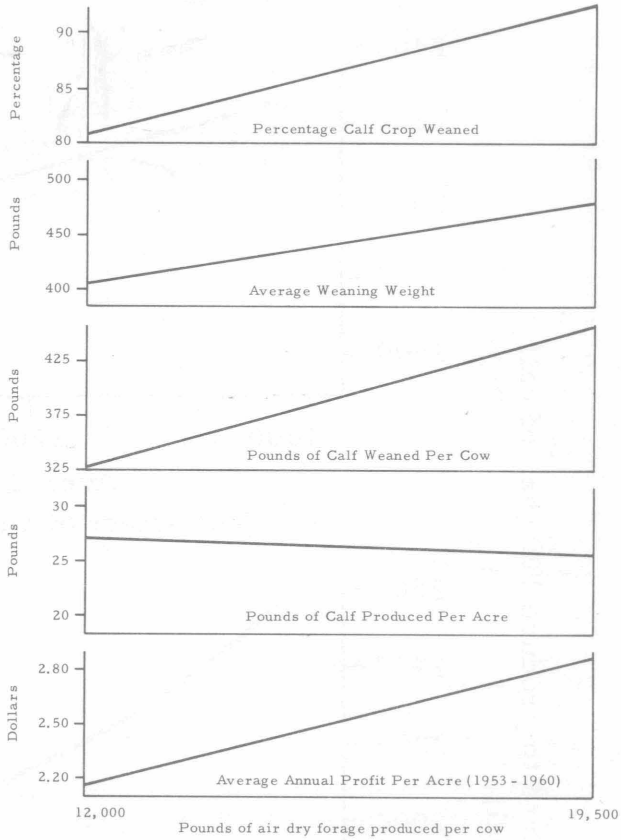

Figure 7. Relationship of calf production to forage production.

a feedlot, the rate and efficiency of gain after weaning must be considered. Rate and efficiency of gain after weaning is overemphasized in most breeding programs compared to the emphasis placed on efficiency of production before weaning. The efficiency of animals produced to be marketed at 1,000 pounds should be a measure of overall efficiency — all feed required in the production of the animals including the feed for fetal development, milk production and 1 year of maintenance for the dam.

Each of the major factors causing differences in feed efficiency should be understood and considered individually, and a decision regarding feed efficiency should include the combined effects of all factors. For example, a group of 900-pound cows should be more efficient than 1,100-pound cows. This is true in producing slaughter calves if the weaning weight, percentage of calf crop and length of production are about the same; but in the production of feeder calves the rate and efficiency of gain after weaning may cause the calves from larger cows to be the most efficient when the young cattle are marketed at 1,000 pounds.

An effective method of comparing feed efficiency with the limitations described above, in

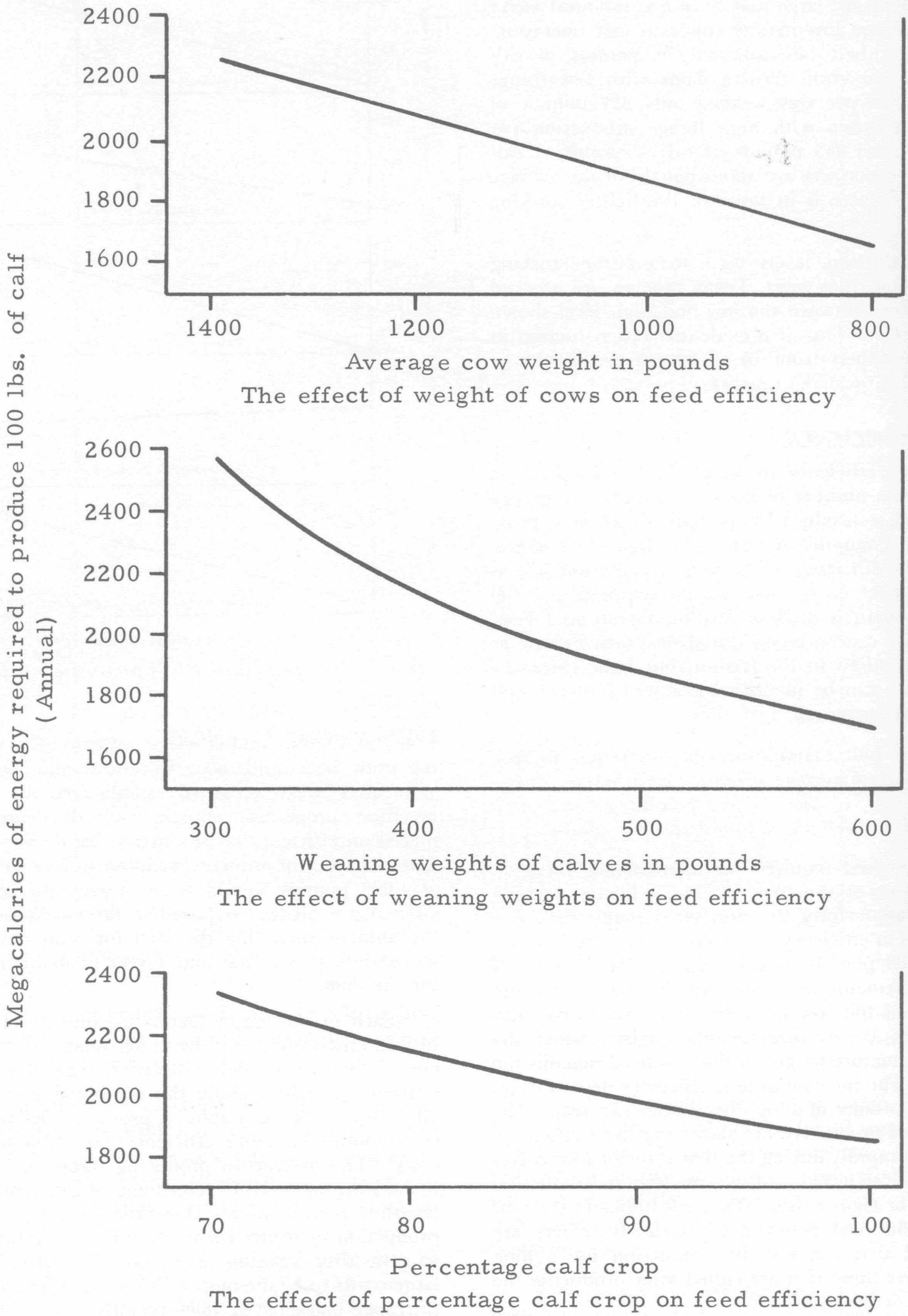

Figure 8. Feed efficiency as affected by production levels. Note—1000-lb. cows and 500-lb. calves unless otherwise specified (2).

the production of weaning calves, is to calculate their weaning weights in terms of percentage of dam weight. A 900-pound cow weaning a 450-pound calf at approximately 7 months produces 50 percent of her body weight. A 1,400-pound cow to be as efficient in the use of feed must also produce 50 percent of her body weight or a 700-pound weaning calf.

Weaning weight expressed as a percentage of mature cow weight also can be used to compare efficiency of production of different breeds or crosses on the same ranch. A purebred dam weighing 1,000 pounds and producing a 400-pound calf or 40 percent of her mature weight would be more efficient than a dam of another breed or cross weighing 1,300 pounds and weaning a 480-pound calf. The purebred cow would be more efficient producing 40 percent as compared to 37 percent from the other breed or cross of dam.

A similar comparison is possible between ranches. Comparisons between the total pounds of weaned calves produced and the total pounds maintained in the breeding herd is an effective comparison. In this comparison, differences in percent calf crop do not alter the efficiences of the comparison, when the producer considers the extra feed required for the increased weight of dry cow will be paid for by the additional gain of these nonproducing cows.

The effect of age of weaning calves within reasonable limits (between 5 and 9 months) has little effect on the accuracy of the measure of efficiency. The greater amounts of energy needed for high milk production for heavier calves at younger ages will offset the energy needed for longer maintenance of body weight for the older calves.

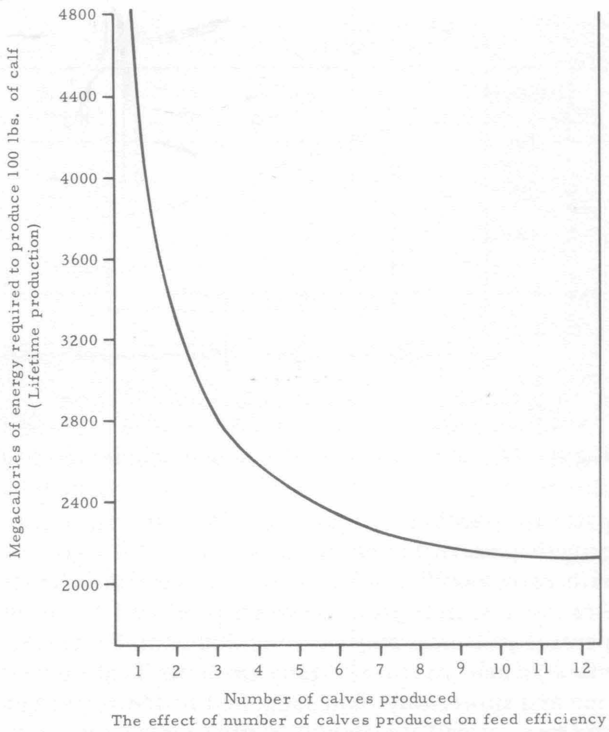

Figure 9. Feed efficiency as affected by production levels (2). Note—Mature weights 1000-lb. cows and 500-lb. calves.

GROWTH PATTERNS AND WEIGHT CHANGES

Wide variations between and within breeds in weaning weights, rate of growth, rate of sexual maturity and mature weight create problems in establishing minimum growth patterns for beef cattle. Suggesting weights at breeding and calving time as a percentage of mature weight and suggesting minimum ages for breeding heifers make the establishment of recommended minimum growth

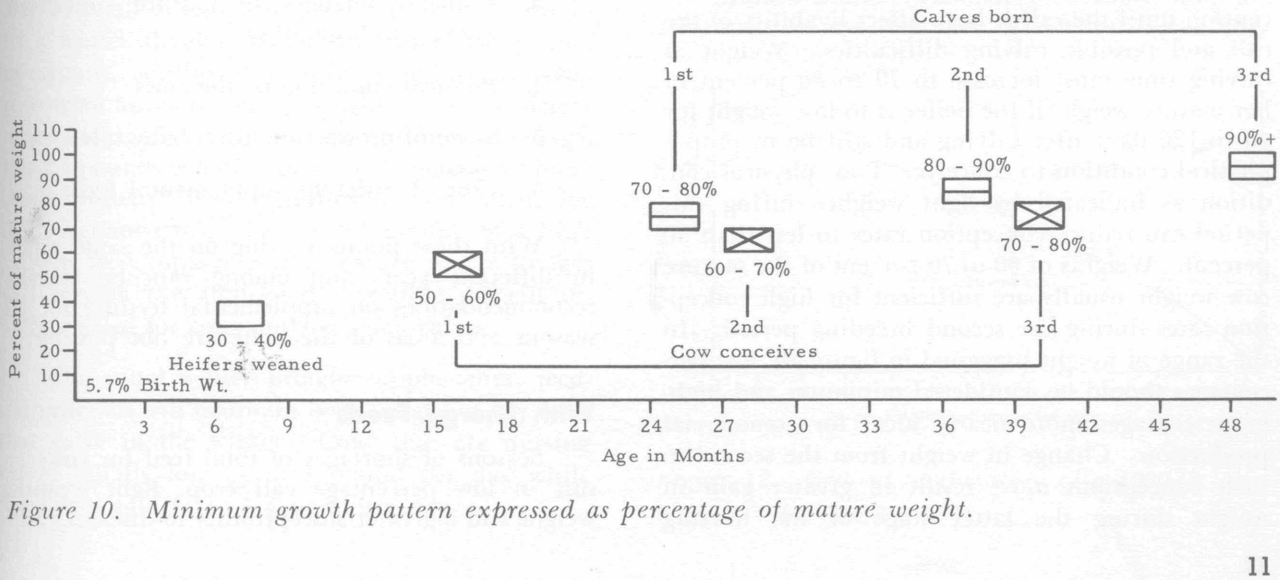

Figure 10. Minimum growth pattern expressed as percentage of mature weight.

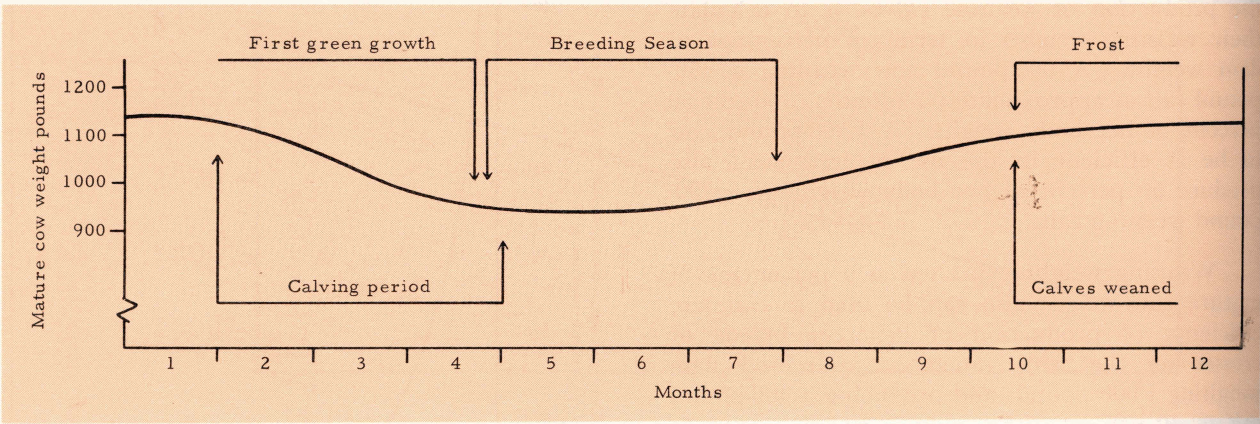

Figure 11. Normal weight changes of mature producing cows (2).

patterns possible. Figure 10 illustrates minimum growth pattern for young beef cows. This growth rate corresponds closely to the growth rate shown in most research projects which produced 85 to 90 percent calf crop and weaning 450-pound calves or more as mature cows. Many cattle in Texas develope at a slower rate than suggested in figure 10, but the percent calf crop and weaning weights generally are too low to be profitable.

A birth weight of 5 to 7 percent and weaning weight varying from 30 to 40 percent of the mature weight of the dam is in the range of normal, health growth and development.

Replacement heifers of the British breeds should conceive if they are 15 months or more in age and have reached 50 to 60 percent of their mature weights. Heifers of other beef breeds and crosses should reach sexual maturity within the same weight range, but may need to be 18 to 24 months of age before reaching sexual maturity. This age and weight directly affects the percentage of calf crop while the changes in weight from conception until the calf is born affect livability of the calf and possible calving difficulties. Weight at calving time must increase to 70 to 80 percent of her mature weight if the heifer is to lose weight for 60 to 120 days after calving and still be in proper physical condition to conceive. Poor physical condition as indicated by light weights during this period can reduce conception rates to less than 50 percent. Weights of 60 to 70 percent of the mature cow weight usually are sufficient for high conception rates during the second breeding period. In the range of weight suggested in figure 10, low percentages should be considered minimum and higher percentages more nearly ideal for commercial production. Change in weight from the second to fifth conceptions must result in greater gain in weight during the latter stage of the nursing and/or the dry periods than is usually lost at or soon after calving. An annual gain in weight is necessary for a heifer to reach her mature weight at 6 to 7 years of age.

Losses in weights during a 90-day calving season of 15 to 20 percent are normal as indicated by data on cows producing 90 percent calf crops and 450 pound calves as shown in figure 11 (2). The general statement about changes in weight of cows which calve in the winter or spring is that the mature cow can lose as much weight during the winter and spring as she has gained in the preceding summer and fall.

SUPPLEMENTAL FEEDING

Some important points to consider about supplemental feeding follow:

1. Amount of forage available
2. Nutritive value of this forage
3. Probable changes in pasture conditions (next 3 to 6 months)
4. Physical condition of the cows
5. Stage of production (dry, baby calves etc.)
6. Cost of different supplemental feeds

With these points varying on the same ranch in different years and among ranches, specific recommendations on supplemental feeding for all seasons and areas of the State are not possible.

With Energy Feeds

Seasons of shortages of total feed for cows result in low percentage calf crop, light weaning weight and a greater susceptibility to diseases. Supplementing the forage supply with hay or grain for a shortage which cannot be efficiently corrected by reduced stocking rates, range management or pasture improvement is a normal part of a cow and calf operation. Indifference to this shortage of total feed by a large percentage of producers is the greatest cause of low production in the average Texas herd. Information in B-1044, *Nutritional Requirements of the Cow and Calf,* can be used to work out energy requirements for periods when supplemental feeding of energy is necessary.

In most commercial operations, the cows lose weight slowly after calving, while the calves gain approximately 1 pound per day. If the calves are born in the proper season, this usually does not exceed 90 days of feeding a cow and calf before new forage growth begins.

With Protein Feeds

The minimum percentage of digestible protein in a ration of pasture forages only is suggested to be 4.3 percent for maintenance of body weight and from 4.8 to 5.3 percent for cows nursing calves (4). The small percentages of digestible protein in pasture grasses in all stages except young active growing grasses indicate a shortage during most of the year. Selective grazing of more nutritious parts of the grass plants must result in the cattle consuming forage of higher nutritional value than shown in the composition of the grasses, because the response of the cattle indicates a higher plane of nutrition. Some Texas ranchers who follow recommended range management practices with deferred grazing are able to winter mature breeding cows on native pastures with no supplemental protein.

When the total volume of forage is limited due to small amounts of grass left on pastures in early winter, decay due to winter rains, overgrazing or drouth, additional protein is needed to keep cows from losing too much weight. When sufficient mature forage is available to furnish needed energy, 1 to 1.5 pounds of a high protein (40 percent or more crude protein) feed is sufficient supplement for dry pregnant cows. Two to 2.5 pounds of a high protein feed supplementing mature native forages will furnish the additional digestible protein usually needed for cows nursing small calves.

The usual winter protein supplemental feeding program will maintain body weight of dry cows that calve in the winter. Cows that are nursing calves usually lose ½ to 1 pound per day while the calves gain ¾ to 1½ pounds a day.

Table 2. Average composition of 11 Texas grasses in different stages of growth (based on 90% dry matter) (4)

Growth stage	Digestible protein, %	Digestible energy, megcal.
Young	5.9	1.08
Medium	3.3	1.00
Bloom	2.9	1.04
Mature	1.8	0.96

FEEDING DURING COLD WEATHER

The production efficiency and comfort of a mature cow is not reduced by a decline in the environmental temperature from the comfort zone of 60 degrees to below 0 degree F, provided she is full of forage, has a dry hair coat and is exposed to dry still air. The environmental temperature at a given level of feed intake where no additional feed is necessary to maintain body temperature is called the critical temperature. This critical temperature is slightly above the temperature at which cattle begin to shiver. Figure 12 shows the change in critical temperature as the daily consumption of energy changes. The cow on a fasting diet or without any feed will reach a critical temperature at about 55 degrees F. A maintenance ration will lower the critical temperature to about 23 degrees F. With an increase in feed consumption, the critical temperature will drop to an estimated -117 degrees F for a dairy cow properly fed during heavy lactation (1). The suggested critical temperature will be lower in long-haired cattle. Wet hair coats and wind velocity increase the critical temperature. A change in wind velocity from ½ to 10 miles per hour will cause dairy cows to increase their heat production by 20 to 35 percent in order to maintain the same body temperature.

Brahman and Brahman-cross cows have an advantage in the tolerance of hot weather. This

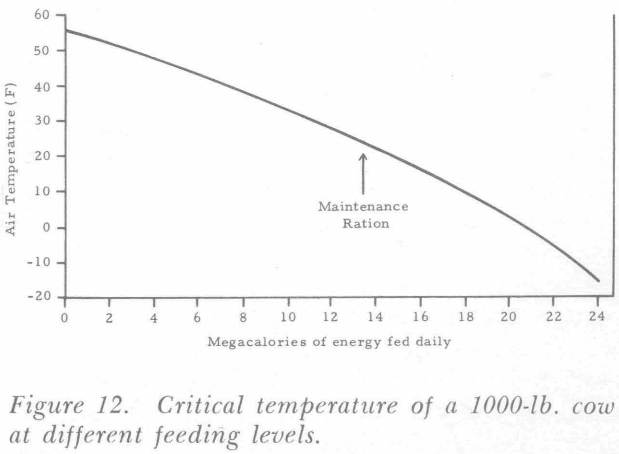

Figure 12. Critical temperature of a 1000-lb. cow at different feeding levels.

advantage is due to greater surface area per unit of weight, lower heat production due possibly to a lower basal metabolism and a different kind of hair coat. These advantages in heat tolerance work as a disadvantage during cold weather, making these cattle more susceptible to adverse cold wet weather.

Cattle can keep warm and survive cold weather if they consume sufficient forage. Low-quality roughages high in fiber serve as effective feeds during storms because of the high heat production that results from digesting the fiber in the roughage.

FEEDING FOR MILK PRODUCTION

Little information is available on estimates of feed requirement for milk production in commercial beef operations. A wide range of nutritional levels that cause the cow to vary from a loss of 1 pound to a gain of 2 pounds per day in her body weight while nursing a calf makes specific feeding recommendations for milk production impossible. For example, if a cow is losing 1 pound per day and her energy intake was increased by 1 megacalorie, how much of this extra feed would be used for milk production and how much to reduce the loss of weight in the dam is not known.

After maintenance requirements are met, the dairy information shows that .040 of a pound of digestible protein will produce 1 pound of milk containing .029 of a pound of digestible protein. This indicates that if a pound of digestible protein is used only for milk production, the calf would receive 72.5 percent of it in the milk. It takes 0.57 megacalories of digestible energy used only for milk production to produce a pound of milk with 0.32 megacalories of energy. This indicates only 56 percent efficiency in converting energy in cow feed to energy in milk.

FEEDING DURING DROUTH

During a prolonged drouth, breeding cattle usually are culled according to age and productivity. The remaining cows are maintained at greatly reduced weights and production. Feed requirement for lighter weight cows and calves can be worked out using the information in B-1044, *Nutrient Requirements for the Cow and Calf.*

As drouth continues, further reductions in numbers are necessary. This is usually accomplished by further culling all open cows when the calves are weaned and selling all replacement heifers. An additional reduction in feed requirements can be made by weaning calves 45 to 60 days earlier than usual.

Pastures may become so devoid of forage that it would be more efficient to place the cattle in a small trap to reduce the waste of feed used in walking to find some forage to eat. The feeding level must remain at or near maintenance for the cows and enough to produce 1 to 1¼ pounds gain per day for the calf.

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