The Environmental Conscious Cow

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All across the country, managers, homeowners, and car companies have bought into environmentally sound business practices. There is an urgency amongst lawmakers to create a country that is more in tune with nature. Cattlemen are doing the same. As fossil fuel prices continue to climb so does the production of ethanol. We are all aware that ethanol production competes with the cattle industry for corn and for property in which hay crops may once have stood. Urban boundaries are also encroaching on agricultural land which is driving up the price of crop and grasslands, leaving little opportunity for ranches to expand. Historically, feed costs have contributed up to 60% of a ranch's operating cost; however, with the changes occurring in today's world, feed costs will become significantly higher. As a result, ranchers are faced with the need to build income on a fixed land mass and narrowing profit margin. Cattlemen across the country are beginning to evaluate their management practices to limit the amount of fossil fuel consumed on the ranch and decrease their operating expenses. Both of these tasks can be accomplished by reducing the amount of harvested feed a cow will require. In doing so, we can create an environmental conscious cow; a cow that is in tune with nature and turns a profit.

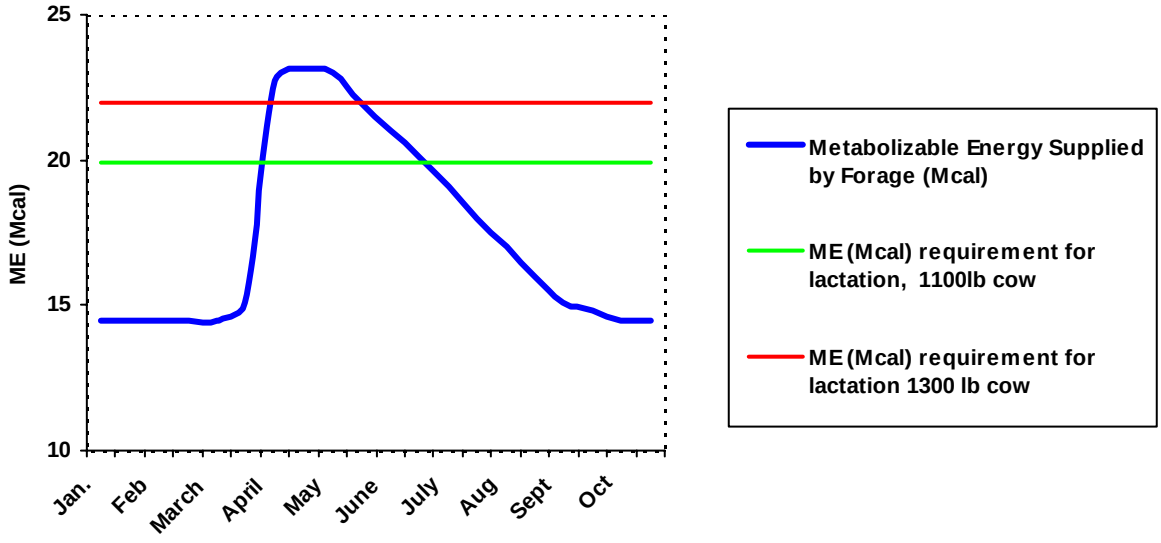
Reduce Feed Cost by Controlling Mature Size

Normally, a cow's nutritional requirements for maintenance are met with about 70% of the feed she consumes; the remaining 30% will go toward production. Kit Pharo (Pharo Cattle Company of Eastern Colorado) likes to point out that he does not get paid for maintenance; therefore, 70% of his feed expense has absolutely no economic return. Mature size of the cow is arguably the most influential factor on nutritional requirements. The larger the cow, the more groceries she will need to consume to maintain body weight and produce at the same rate as a smaller cow. Controlling cow size is a tool that can be used to manage feed inputs.

Figure 1 maps the metabolizable energy (ME) of native grasses in Eastern Oregon. The horizontal lines represent ME requirements (Mcal/day) for 1100 and 1300 lb cows. Of great importance is the extended period of time in which forage can meet nutrient demand of an 1100 lb cow over the larger cow. The smaller cow can remain

at the same level of production for up to one month longer than the larger cow. In turn, the smaller cow will have a longer period of time to pass high quality milk on to her calf without supplementation.

Figure 1. *Metabolizable Energy supplied by native range in the sagebrush-bunchgrass rangeland in the Great Basin of eastern Oregon. **Horizontal lines depict ME requirements for average lactation for the first 3-4 months post gestation and maintenance.



Many of you are questioning this line of thought. Smaller cows mean lighter weaning weights right? That translates into less money right? Wrong. Your grasses will produce a set amount of nutrients in a given year. This set amount of nutrients will translate into a given amount of production, e.g. pounds of salable beef. We will assume that your ranch produces one pot load of weaned calves, 50,000 lbs. What would you rather have, 400 lb calves to market or 700 lb calves? If you choose 700 lb calves you would be selling 71 calves, trading at $96.00/cwt and gross profit would be $48,000.00. If you choose 450 lb calves you would be selling 111 calves, trading at $110/cwt and gross profit would be $55,000.00. That is a $7,000.00 difference in these two pot loads of calves. Look at it another way. A ranch that can support 100 head of 1300 lb cows should also be able to support 120 head at 1000 lbs, an increase in carrying capacity of 20%. Iowa State University analyzed several commercial herds and reported that calf weight sold accounted for only about 5% of profit variation between high-profit vs. low-profit

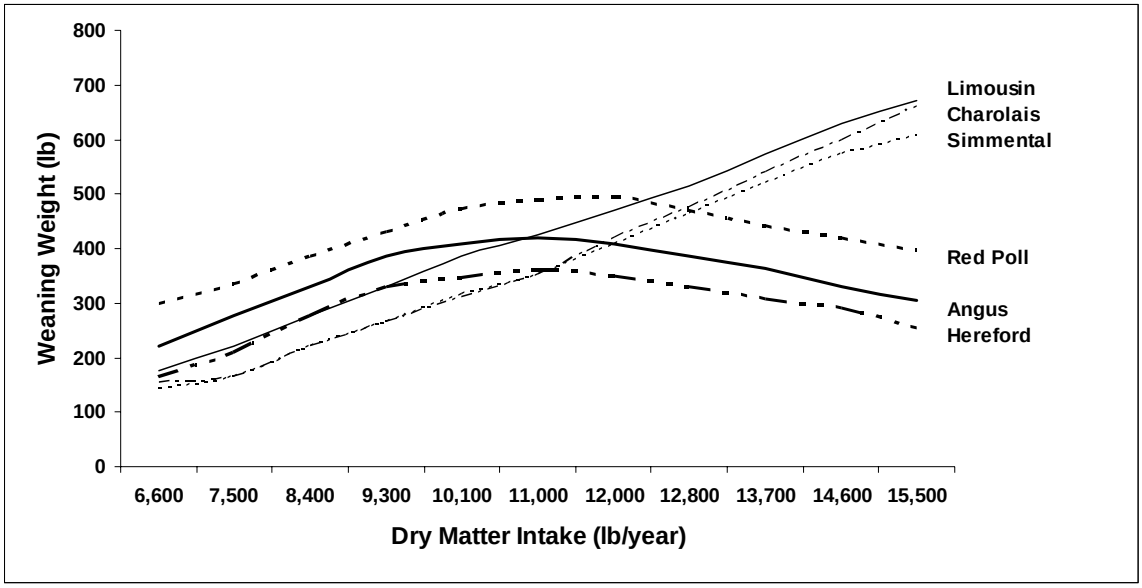
producers. They concluded that bigger isn't always better and that each operation will have an optimum level of production. However, feed cost was the most critical profit factor and accounted for 50% of the variation between low-profit and high-profit producers.

North Dakota State University has also documented that smaller framed cows produce calves that are not only acceptable on the rail but are profitable as well. A set of crossbred Lowline (Angus cattle selected for low yearling weight over the past 30 years) steers produced carcasses that valued $1,094, $1,223, and $1,047 for three years; 2004, 2005 and 2006 respectively. The carcasses graded exceptionally well with a majority of the carcasses falling in quality grade of Choice or better and YG 2. Furthermore, a majority of the hot carcass weights were within 650-850 lbs and had ribeye area's of 11-16 square inches. Wow! Let's revisit the industry goals for beef carcass characteristics; carcass weight of 750 lbs, QG of Choice or better, Yield grade 2, ribeye area of 14 square inches.

Reduce Feed Cost by Genetic Selection

Level of cow performance (lactation and/or growth) has an affect on feed inputs. For example, heavy milkers need more groceries than a cow of similar size and moderate milk yield. Selection of single traits such as yearling weight and weaning weight often leads to mature cows that are much too large for some types of grass pasture/environments to support. Likewise, selection for high milking ability can lead to a cow whose nutritional requirement for production can not be met by grass pasture alone. The result in both cases is a thin cow that does not breed back or a cow that requires supplemental nutrients. Genetic selection for desired traits will not only affect cow size, milking ability, and calf weaning weights but also longevity (stayability) of the cow on your ranch. Also, in work at the U.S. Meat Animal Research Center, research has shown that forage availability can influence the efficiency, and suitability, of various beef cattle breeds (Jenkins and Ferrell, 1994) for a given environment. Figure 2 illustrates that Red Poll, Angus, and Hereford cattle will wean more pounds of beef per cow exposed at low forage availabilities compared with Limousin, Charolais, and Simmental; however, as forage allowance increases, the increased growth potential of the Continental breeds becomes evident and surpasses the genetic ability of the English breeds. Therefore, it is critical for each cow/calf producer to evaluate the environment and forage resources available in a given area when deciding on the genetic makeup of the cow herd.

Figure 2. Predicted weight of calves weaned per cow exposed at varying dry matter intakes for 6 breeds of cattle (adapted from Jenkins and Ferrell, 1994).



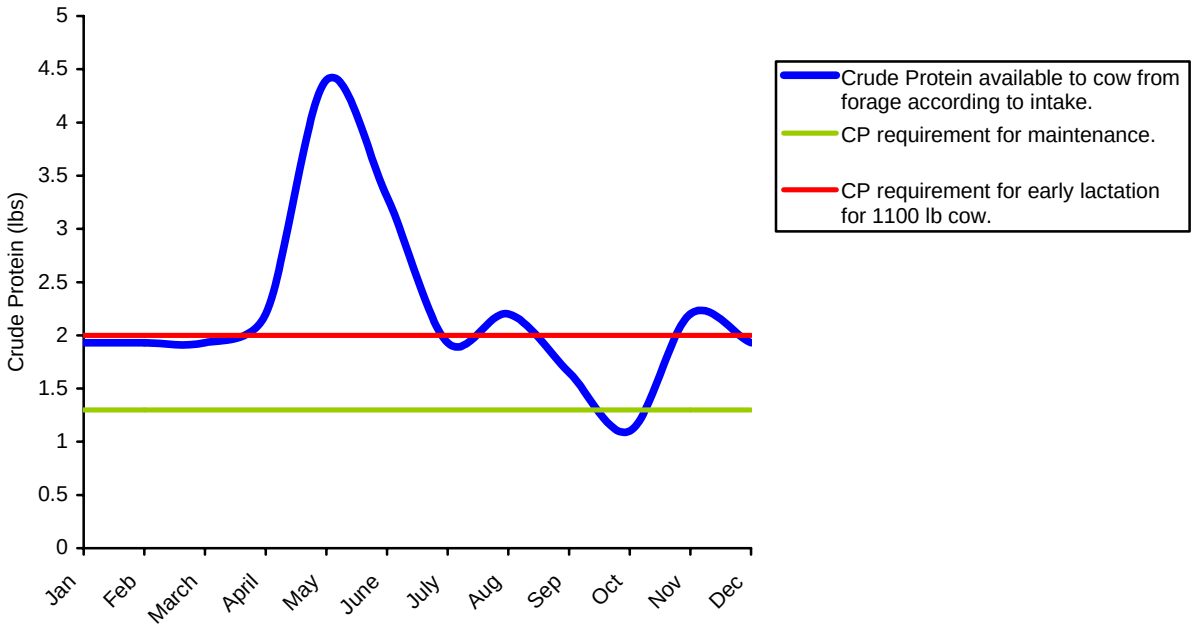
Producers can also take advantage of heterosis with crossbred cows to increase performance over purebred cows. Traits that have low heritability will show marked improvement with crossbreeding (eg. fertility). Producers face a challenge in combining breeds and biological types to obtain an acceptable combination of maternal, growth, and carcass traits as they do have a tendency to be antagonistic to one another. However, sires that produce progeny acceptable to the consumer and have the ability to survive on the ranch, with limited inputs, can be achieved with careful thought and planning. Avoid choosing traits that are extreme and match the cow to what your forage resources can support, paying special attention to mature size, scrotal circumference and milking ability.

Reduce Feed cost by Matching Forage to Production

When choosing the right cow for your environment is not enough to insure that you are lowering your annual feed costs. Ranchers also need to plan their production cycle around environmental conditions, labor availability and marketing schemes. A cow's nutritional requirements fluctuate according to her physiological state. A cow in peak lactation has much greater requirements than a dry cow in the third-trimester of pregnancy. Also, forage quality and quantity is not constant throughout the year and fluctuates with season. Figure 3 maps crude protein content in native forage near Burns, OR over the course of the year. The horizontal lines depict the crude protein requirement for a 1100 lb cow the first 3-4 months after calving and the crude protein requirement for

maintenance. Notice that native range alone can support a cow with these high requirements for several months provided that there is enough forage available for the cow to consume at least 2.5% of her body weight. Crude protein requirements for maintenance are met by native range for a majority of the year, again assuming that there is adequate grass available. Notice that although native range meets crude protein requirements for early lactation for several months, energy requirements (Figure1) are only met during a narrow window in the spring, beginning in April and lasting thru early June or early July. These graphs do not take into account variation in intake nor declining digestibility and availability of forages from late summer through winter. Whenever protein is deficient, microbial protein needs are not being met and the population of microbes in the rumen decline. In turn, digestibility of forage is reduced and rate of passage is slowed. Intake is then reduced and other nutrients such as energy are further reduced by limited intake. Therefore, forages that are graphed at the threshold for nutrient requirements may very well be considered deficient.

Figure 3. *Crude protein as supplied by native range over time, based on intake of 2.5% (27.5lbs) of cow body weight (1100lbs). **Horizontal lines depict CP requirements for lactation (ave milking ability) the first 3-4 mo post gestation and maintenance.



A cows' failure to fit to her environment (or the manager's failure to create the environmental conscious cow) leads her directly to the sale barn or freezer. In most herds, 50% of the cows are culled due to lack of reproductive performance. This is a function of age and weight at puberty, conception rate, gestation length, calving ease, postpartum interval and longevity. These components are influenced directly by milking ability, mature weight, body condition score, and calf weight. All of which are influenced by genetics and environment (weather and available forage/feed). Producers can increase cow longevity and profitability by matching the cows' biological type to the most economical feed resource and plan major events such as calving according to environmental conditions.

Ranching is at the mercy of increasing fuel prices, increasing hay prices, fluctuating cattle markets, weather, and other factors in which we have little control. However, we can manage risk by managing factors that are within our control. Choose a cow that can survive the conditions of the ranch; a cow with a mature body weight

and level of performance whose nutritional needs can largely be met by grazed forage and minimal/no supplementation; a cow that can remain in pasture in good body condition throughout the year and still breed back so that she produces at least one calf every 365 days for 8 or more years. By accomplishing this, you will create the environmental conscious cow; a cow that is in tune with nature and turns a profit.

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