

2006

The Decision to Finish Cattle on Pasture - an Ethnographic Approach

J D. Lozier
West Virginia University

E B. Rayburn
WVU

J Shaw
WVU

Follow this and additional works at: https://researchrepository.wvu.edu/faculty_publications

Digital Commons Citation

Lozier, J D.; Rayburn, E B.; and Shaw, J, "The Decision to Finish Cattle on Pasture - an Ethnographic Approach" (2006). *Faculty & Staff Scholarship*. 3210.
https://researchrepository.wvu.edu/faculty_publications/3210

This Article is brought to you for free and open access by The Research Repository @ WVU. It has been accepted for inclusion in Faculty & Staff Scholarship by an authorized administrator of The Research Repository @ WVU. For more information, please contact beau.smith@mail.wvu.edu.

*RESEARCH, REVIEWS, PRACTICES,
POLICY AND TECHNOLOGY*

The Decision to Finish Cattle on Pasture:
An Ethnographic Approach

John Lozier
Ed Rayburn
Jane Shaw

ABSTRACT. Conventional cattle enterprises send grain-finished beef to a commodity market. Pasture-finishing offers farmers better returns in an alternative “niche” market with different costs, uncertainties and risks. Such enterprise decisions are not well-structured problems soluble with classical decision analysis. Instead, they require an ethnographic process of “framing” from a personal viewpoint.

John Lozier is affiliated with the Harping for Harmony Foundation, 428 Van Gilder, Morgantown, WV 26505 (E-mail: jl@harpingforharmony.org).

Ed Rayburn is affiliated with the WVU Extension Service, P.O. Box 6108, Morgantown, WV 26506-6108 (E-mail: edward.rayburn@mail.wvu.edu).

Jane Shaw is affiliated with the USDA–Natural Resources Conservation Service, P.O. Box 70, Verona, VA 24482 (E-mail: jane.shaw@va.usda.gov).

Address correspondence to: John Lozier at the above address.

This report is a product of the “Pasture-Based Beef Systems for Appalachia” Project (PBBSA), a multi-institutional collaboration among West Virginia University (WVU), US Department of Agriculture’s Agricultural Research Service (USDA-ARS), Virginia Tech (VT), and the University of Georgia (UG).

Journal of Sustainable Agriculture, Vol. 28(3) 2006
Available online at <http://www.haworthpress.com/web/JSA>

© 2006 by The Haworth Press, Inc. All rights reserved.
doi:10.1300/J064v28n03_03

Here we examine the natural and cultural setting of beef cattle enterprise systems, and their time frame for action planning and implementation. We present four brief case studies of farmers who practice pasture-finishing.

An “ethnographic decision model” (EDM) asks farmers about their personal, material, social and financial resources. In behavioral decision theory, a parallel line of research is “naturalistic decision making” (NDM), focused on the proficiency of decision makers dealing with ill-structured problems, incomplete information, uncertainty, and urgency.

Pasture-finished beef production can be an addition to a risk-reducing portfolio of enterprises. The key is classification of the herd into two groups, destined either for the niche market or for the commodity market. When forage growth conditions are unfavorable, the niche group receives preference and commodity animals get second best. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com> © 2006 by The Haworth Press, Inc. All rights reserved.]*

KEYWORDS. Beef, cattle, ethnography, farm, naturalistic, niche, pasture, proficient, risk

INTRODUCTION

North American cattle producers, like farmers everywhere, face uncertain and risky situations that require decisions on a daily, seasonal and multi-year basis. Cultural knowledge that is required for sound decisions comes from tradition and experience as well as science. Available resources and personal preferences also affect farm enterprise decisions. A complex real-life decision for one or another enterprise cannot be reduced to a quantitative decision process, except perhaps after first framing the problem through a qualitative and ethnographic investigation of the situation (Hardaker et al., 1997; Johnson, 1989). Framing is variously known as situation assessment, sizing up, or structuring the decision.

Here we regard the decision to finish cattle on pasture as an alternative to “conventional” production through feedlots and commodity marketing. The pasture-finished alternative poses a set of distinctive production and marketing problems. Success in conventional cattle enterprise involves production efficiency and volume with low profit margins. Success in pasture-finished production and niche marketing involves

adding value and improving profitability through more direct marketing that captures a larger share of the retail dollar.

This paper is a synthesis of ethnographic observation and experience accumulated by the authors in the course of agricultural education and extension practice over many years, and particularly since 2000 in the course of a long-term multi-institutional and multi-disciplinary project (Pasture-Based Beef Systems for Appalachia, PBBSA). Case study information is extracted from farm visits conducted in 2001. Results of a nationwide survey of pasture-finished beef producers is reported in Lozier et al. (2004).

As will be seen, commodity and niche market enterprises are not mutually exclusive. With risk management in mind, the “portfolio” of a farming system can include both commodity calf production and pasture-finishing, as well as other farm enterprises.

In Section II below, we offer four brief case studies of pasture-finishing cattle enterprises.

In Section III, we offer an ethnographic or “cognitive anthropological” description of the culture of cattle production in North America. This anthropological view holds that culture consists of “knowledge and belief” which allows individuals to behave “appropriately” in a particular social group or environment (Goodenough, 1963).

In Section IV, we connect our work with theoretical work in anthropology (Ethnographic Decision Models, or EDM; Bernard, 2002; Gladwin, 1980, 1989) and in decision theory (Naturalistic Decision Making, or NDM, Lipshitz et al., 2001; Zsombok and Klein, 1997).

CASE STUDIES OF PASTURE-FINISHED CATTLE PRODUCERS

Here we present four brief case studies, selected from among 41 more detailed studies of pasture-finished cattle producers that were visited in 2001. These cases are selected to illustrate some important contrasts, particularly in *type of production* and *degree of market development*.

Case 1: Low Intensity Production, Undeveloped Marketing

WB, like his ancestors for several generations, farms on a large plantation in the Southeastern US. His primary farm income is from ornamental tree production. He also maintains a herd of cattle under continuous

grazing, an extensive system. Herd replacements come from within, except for a new bull every few years. The farm has little internal fencing. Pastures are level former cropland, mostly unimproved, except for limited areas sown to forage crops each year. Mild winters mean he can maintain production with a low stocking rate and low management. WB normally sends his cattle to the commodity market. In recent years, with no change in production, he has sold some of his cattle for pasture-finished beef. This was a response to local consumers who sought him out.

At his advanced age, and adequately supported by other enterprises, WB is not interested in expanding his commitment to the pasture-finished cattle enterprise. However, he has formed a promising partnership with an unrelated younger farmer. The young farmer has established pasture-raised chicken and other enterprises on part of the farm. If this intergenerational partnership thrives, there is an opportunity for intensification of the pasture-finished beef operation.

Case 2: Intensified Production, Undeveloped Marketing

CM, in his 40s, recently moved from a crop-producing farm elsewhere, establishing a new 300-acre cattle farm on flat land in the southern US. With investment by an off-farm partner, he has established a year-round controlled grazing operation with about 100 cattle. A few have been marketed as pasture-finished in a distant city, but most have been sent to the commodity market. Lacking a ready local market for pasture-finished beef, he hopes to be involved in cooperative marketing with like-minded producers. He also considers the possibility of on-farm retail marketing.

With just two years experience in cattle production, and committed to pasture-finished operation, he is positioned to take advantage of an expected increase in demand.

He works full-time on the farm, where his presence also provides supervision and companionship for a disabled child. His wife has a job off-farm, and also raises household chickens and a garden.

Case 3: Intensified Production, Successful Marketing

DS lives with his wife, AR, in the middle Atlantic region, on the farm that came from his parents. They have developed a vigorous direct marketing program that sends 10 to 15 pasture-finished cattle direct to consumers each fall. Their production has been a stocker operation, with purchase of 100 to 200 yearlings for spring and summer grazing. They

plan to switch to a cow-calf operation at some future time. The majority of the animals go to the commodity market. DS says that “there is not a lot of risk” in pasture-finishing, because extra animals can always be sold at the regular auction barn.

Husband, DS, is a large animal veterinarian, which gives him in addition to income an important link to other cattle producers. Wife, AR, provides home schooling to their two children, and also manages the pasture-finished direct marketing effort. As a team they are interested in continuing to expand the marketing program, and to build up their own production system to an ideal scale of about 30 cow-calf pairs and no more than about 90 animals altogether.

Case 4: Intensified and Diversified Production and Marketing

Neither PJ nor his wife, KJ, grew up farming. After a successful career in construction, PJ purchased farmland and established a diversified livestock operation with cattle, sheep, goats, chickens, and even llamas. The grazing species are mixed and integrated in a controlled fashion. The couple are both very committed to promoting pasture-finished beef enterprises, not only at home but also through participation in regional and national farm conferences and activities.

This farm team gains a great advantage from their location near an urban market where they sell directly to several local restaurants and retail outlets. Furthermore, they are interested in establishing an on-farm retail market, but this would be in partnership with a younger entrepreneur that has yet to be recruited. They also have contracted with at least one other local farmer to provide grazing, at a premium rate, for animals to be pasture-finished for their developing niche market.

PJ and KJ have no children of their own to succeed in the business. Instead, they have a partnership arrangement that will eventually leave the livestock operation to a young farm manager.

CASE STUDIES DISCUSSION

There is great diversity and richness of detail in just four brief case studies. Our approach, here and in Section III below, is to identify resource endowments (personal, material, social, and financial); and to consider how they may be used in production and marketing.

In our first case, due to advanced age WB has somewhat limited personal resources of health and strength. On the other hand, he has a very

substantial accumulation of resources that are material (farmland, equipment) and social (family, community connections). Partnering with a young farmer offers the prospect for growth and succession in the enterprise.

In our second case, CM is a mature man with farming knowledge and skills. However, he has relocated to a new farm, investing resources in a new enterprise and facing new risks. Relocation means unfamiliarity with the material resources (land and infrastructure) and reduced social resources (local community ties). His success depends heavily on personal resources and good luck in the early development of the farm. He is committed to intensified production, but has not yet developed his marketing.

Our third and fourth cases illustrate enterprises that are relatively well endowed with personal, material and social resources. The difference between them illustrates the importance and limitations of financial resources. Farming for DS and AR is a continuation of a family tradition. For PJ and KJ, farming is a new enterprise, founded in financial investment, but developing through application of personal and social resources.

BEEF CATTLE ENTERPRISE SYSTEMS IN NORTH AMERICA: CONVENTIONAL AND OTHERWISE

In this section, we offer a summary of cultural knowledge that is required for successful beef cattle production.

The Natural and Cultural Setting. Annual distribution of forage is heavily concentrated in the spring flush, when grass grows and accumulates faster than it can be consumed by livestock. In summer, growth slows, and accumulation is slowed or reversed. In autumn, there may be a resumption of growth and accumulation, before a decline to a winter minimum. From years of observation, farmers develop local “rules of thumb,” explicit or implicit. For example, a farmer may estimate that a certain percent (50% or 60%) of annual production occurs during a period (90 or 60 days) in spring. Many characteristics of cattle (late maturity, seasonal fluctuation in weight, continued reproduction over many years) are adaptations to seasonal variation in available forage.

Cattle enterprises involve control and manipulation of two main variables: animal numbers, and feed availability. Animal numbers are reduced through slaughter or sale, and increased through breeding or purchase. Animal numbers in relation to land area define a stocking

rate. In the long term, feed production is a function of factors that can be fairly well known (land and soil quality, area and climate). However, feed availability at any particular time varies with weather conditions (short term, unpredictable); seasons (medium term, predictable) and from year to year (medium and long term, unpredictable). The task of the grazer is to manage both herd and feed supply by controlling the movements of the animals with fencing or, in earlier times, with close herding.

Major feed resources are standing pasture, conserved forage (hay, silage), and grains (corn, etc.). Live pasture loses its nutritional value, and is “wasted” (actually “recycled” to the soil) if not promptly harvested (consumed or conserved). Live pasture quantity and quality, and even annual distribution, can be controlled to some degree by harvest methods, including adjustment of frequency and intensity of grazing activity (Bryan and Mills, 1988). Conserved forage quality and quantity can be affected by timing and technologies of harvest and storage. Grain, being highly concentrated, can provide high feed quality but generally at a much higher cost, compared with silage, hay, or standing live pasture. Grain is used in North America mainly for finishing, generally off-farm in feedlots.

Material and management input levels (and systems) can be low (extensive) or high (intensive). In extensive systems, risk is held down by setting a low stocking rate, allowing forage to go to waste in good growth years. In intensive systems, higher stocking rates give better returns in average and good growth years, but suffer the risk of severe losses in bad growth years. To minimize this risk, cautious experts recommend stocking at a level substantially below that which would be appropriate for the average year (Rayburn, 2003). This automatically means lost opportunity and sub-optimal performance in good growth years.

The Beef Production Cycle. The cycle of production can be divided into five stages: stocking, nursing, backgrounding, growing, and finishing.

Stocking (or restocking) is replacing of animals removed or harvested earlier in the cycle. Seasonal shortage and abundance of available forage means farms tend to be either under-stocked or over-stocked at any point in time. Early spring is critical, because available forage is limited, but a sufficient herd must be gathered for the anticipated spring flush. Stocking is by natural increase (calving), or by purchase, or both. Systems that exploit calving are “cow-calf” operations. Systems which

adjust stocking levels by timely purchase and sale are “stocker” operations. Cow-calf and stocker operations are sometimes mixed.

Nursing is a period of up to about 7 months of age during which calves nurse and begin grazing. Dairy calves, separated at birth, may be bottle-fed until they can graze after about one month. Longer nursing produces a larger calf that is more valuable, when retained on the farm, or brings a better price when sold.

Backgrounding is a transitional period that involves weaning, vaccination, and health management. About 6 weeks of backgrounding treatment adds value when animals leave the farm as feeder calves. This stage is not so important if animals do not leave the farm until later.

Growing takes place over a period of many months, as calves and older animals are fed pasture and/or hay, until they reach a weight that is judged ready for finishing. This growing period inevitably includes a winter season of relatively scarce forage. Required growth time varies, depending on the quality of the feed that is provided. Stocker operations specialize in growing; in other words, their product is weight gain.

Finishing is a period of final weight gain which brings the animal to slaughter weight and condition. Conventional finishing occurs year-round with grain in feedlots, where profitability depends on feed conversion efficiency. Feedlot gains must be rapid and continuous to cover costs of yardage and feed (“room and board”). These industrial conditions give market incentives (premium prices) for truckload lots of animals of uniform size and proven performance (rapid, continuous weight gain). Feedlot animals, when finished, must be sent promptly to slaughter to avoid the measurable “time cost” of each additional day.

In contrast, finishing on pasture can offer a cheaper alternative. However, good management is critical. The finishing animal must have abundant or unrestricted access to good or excellent quality live or standing forage, for a period of several weeks.

Timing of the finishing process cannot be as precisely controlled. Compared with the feedlot, pasture-finishing is somewhat more seasonal, as with wild game animals. When an animal is deemed finished, the timing of slaughter is not so critical for profitability, as with feedlot finishing. In other words, compared with feedlots, weight gain in pasture-finishing need not be rapid and continuous.

The Four Seasons of Forage. Animal growth and reproduction are constrained by seasonal forage abundance and shortage, to which the bovine species are adapted. With adequate nutrition, cattle reach sexual maturity in the first year, and deliver their first calves in the second year. Calving can occur in any season, but winter poses extra risk to both

cows and calves. Generally, best practice involves the control of breeding and harvest so as to fit the expected annual flux in forage production and in market demand. An uncontrolled herd tends to include animals at various stages of development, requiring more individual treatment.

Spring. Pasture growth resumes when light, moisture, and soil and air temperature conditions are met. This can vary by weeks from year to year, and also with latitude and altitude. The herd that has come through the winter may include cows, calves, heifers, steers, and bulls. Their condition varies with the winter treatment they have received. Heifers are commonly timed to deliver their first calves in early spring, and mature cows a month later. Calves and cows convert rapid pasture growth into rapid animal gain.

In spring, the farmer can review and evaluate the winter stocking level. Hay surplus or shortage in spring suggests that winter stocking was too low or too high. Immediate adjustments can be made by purchase or sale of animals. The longer term challenge, over years, is to establish and maintain a system that matches animal and forage production.

As spring advances, forage accumulates despite heavy and growing consumption. This provides an opportunity for farmers to finish animals on pasture. Under controlled grazing, for best utilization, the herd moves rapidly from one pasture to another. Excess forage production is managed by reserving some areas for hay production and as “buffers” for later grazing when growth slows down in summer. Under continuous grazing, a lower stocking level can be managed with less effort. In a good growth year, grass can accumulate much faster than a herd of a given size can consume it. In a bad growth year, the same herd might consume current growth and there would be no accumulation.

Summer. As the herd feed requirement grows, into the summer, rainfall declines, evapotranspiration increases, and forage growth slows. In top condition in early summer, heifers and cows are bred for calving the following spring. A tipping point is reached, where herd consumption exceeds the rate of forage growth. Ideally, at this point, accumulated standing forage will suffice to maintain the herd through the rest of the season. To achieve this ideal, various management strategies are implemented. Aftermath grazing may be practiced on hayfields which have produced a first cutting in early summer. Other hayfields may be reserved for second cutting or left standing as a winter grazing stockpile. In a bad growth year, standing forage can be depleted to a point resulting in damage to pastures, costly resort to feeding hay, or to the selling of animals at a disadvantage.

Autumn. In many areas, autumn brings renewed forage growth with cooler temperatures and increased rainfall. This can be a window of opportunity for good weight gains, and perhaps pasture-finishing. Some of the growth can be accumulated or “stockpiled” in the field, to allow extended grazing into the winter after growth ends. By early autumn, the farmer must assess current resources and anticipated winter requirements, and decide which animals will be held over the winter, and which sent to market. Stocker operators may de-stock the farm, sending all animals to market.

Winter. The winter herd can continue grazing as long as standing forage remains. With suitable planning and control, in a favorable climate, grazing can continue year-round, saving on the costs of forage conservation. When standing forage is gone, animals subsist on a ration of conserved forage until spring growth resumes.

Planning and Implementation Requirements of Beef Enterprises. There are short-, medium- and long-term consequences of cattle enterprise decisions. Every decision requires an explicit or implicit risk analysis. Established routines simplify the management, but do not always provide answers. Here, short-term refers to days and weeks; medium-term refers to seasons and single years; and long-term refers to multi-year farm development actions.

Planning and implementation differ somewhat under two scenarios: “continuous” (or extensive) and “controlled” (or intensive, or rotational) grazing or stocking.

Daily and Weekly Decisions (Short Term). Cattle must have feed and water daily. Under continuous or extensive grazing, stocking rate is set low, production and risk are low, forage is wasted in good growth years, losses are limited in bad growth years, and little management is required. Under controlled (intensive, rotational) grazing, with a higher stocking rate, the movement of cattle from spent pasture to new pasture must be managed on at least a weekly basis.

Actual development of a season, from day to day, is subject to weather uncertainty. Farmers must monitor actual forage conditions, across the entire farm, and make adjustments. Haymaking is triggered by plant development, but must be fitted with current weather forecasts. When available forage is insufficient, the farmer may be required to delay rotations, move animals to buffer areas, feed hay, or even sell animals at a disadvantage.

Marketing usually does not involve short-term decisions.

Seasonal and Year-long Decisions (Medium Term). Developments over several weeks, or up to about a year, must be anticipated in areas of

both production and marketing. For production, again, continuous grazing simplifies management by setting a low stocking rate and allowing forage to be wasted in good growth years. Marketing from low management continuous grazing simply involves taking the price offered in the market.

Under higher management, with controlled grazing, again, the two key production variables are animals and plants (stocking and feed planning). Stocking determines the size and makeup of the herd, looking ahead one or more seasons, based on the estimated carrying capacity of land and infrastructure. Feed planning in medium and longer terms involves techniques and timing of seeding, fertilizing, and other actions affecting feed availability in seasons ahead.

Pasture-finished production and marketing considerations come together in the timing of slaughter for particular animals. Because abundant pasture is required for pasture-finishing, spring and fall growth periods offer the best opportunities. In poor growth seasons, it may prove difficult or impossible to obtain satisfactory finish on pasture. When this happens, the animal can be held for finishing later, or sold in the commodity market.

Market planning for pasture-finished beef also involves deciding when, where, and in what form the product will be sold. Medium term planning assumes that a niche market already exists. At one extreme, animals can be sold “on the hoof.” At the other extreme, sale can be by individual cuts in a retail market environment, requiring a year-round market presence. In the more typical mid-range, the beef is sold to individual consumers, as whole or half carcasses, or as mixed boxes of cuts. The farmer disposes of the entire product in a short marketing period, soon after slaughter and packing.

Farm Development Actions (Long Term). Assuming that production is a “going concern,” market development is the core long-term challenge for pasture-finished beef. If the niche market opportunities do not already exist, they must be created through investment and perhaps collective effort with a long term perspective. A suitable market for small and part-time operations, when producing at full capacity, might be nothing more than a short list of local customers. Expanding, full-time, larger, and more diversified farms may need multi-year planning to succeed in marketing. Such plans might involve investments in on-farm retail facilities, web sites, cooperative marketing, and participation in regional direct-marketing associations.

Longer term production decisions would involve investment in fencing, water development, pasture renovation, forage plantation, herd development, etc.

Perhaps the most critical long term decisions involve anticipating the way in which pasture-finishing production and marketing activities fit into family and household enterprises and goals, with changing roles and personnel over years. The question might be, "is this what you want to be doing five and ten years from now?" The pasture-finished enterprise is a major personal and social investment. Returns are not simply economic, but also personal, social and environmental.

**MAKING AN ENTERPRISE DECISION:
ETHNOGRAPHIC DECISION MODELING (EDM)
AND NATURALISTIC DECISION MAKING (NDM)**

In any enterprise, all decisions are not of equal magnitude or complexity. Simple decisions can be prescribed by formal analysis according to an established routine. These can be called "management" decisions. More complex decisions are not taken by formal analysis, but rather from the viewpoint of an informed and experienced decision maker. These can be called "enterprise" decisions. In reality, decisions range across a continuum from simple to complex.

Ethnographic Decision Modeling (EDM) is a qualitative analysis that predicts the choices people make under specific circumstances (Bernard, 2002; Gladwin, 1980, 1989). EDM has been developed in the study of crop choices and medical treatments. Describing cultural situations and choices is the mission of cultural anthropology, often with explicit reference to decision making criteria and processes (Gladwin, 1980, 1989; Barlett, 1989; Cashdan, 1990a). These and other authors have pointed out the practical limitations of formal prescriptive decision analysis (Johnson, 1989; Gladwin and Murtaugh, 1989; Cancian, 1989; Hoben, 1989; Cashdan, 1990b; Dreyfus, 1997). These limitations are acknowledged even by stout advocates of prescriptive decision making (e.g., Hardaker et al., 1998).

When applied formally, the EDM methodology asks a set of key informants why they have made a particular choice (e.g., crop, medical treatment). From accumulated answers, a set of queries is fashioned into a "decision tree" which can be presented to new informants. Answers can be used to predict that new informant's choice. For example, from our cattle production setting, farmers must often decide "shall I cut hay

today? yes/no.” This is a simple and important management decision. Relevant yes/no queries would include weather prospects, stage of plant growth, hay supply on hand, equipment and manpower availability, etc. The problem is relatively simple because there are a few obvious factors that can lead to a fairly reliable prediction.

With complex situations such as the enterprise decision to undertake a pasture-finishing operation, many factors may affect the choice or outcome. Reliable prediction is difficult or impossible. However, ethnography is useful if it clarifies the cultural choice facing the farmer. The decision to finish cattle on pasture, or not, implies a commitment to a management regime with its own distinctive set of routine decisions.

Independent of EDM scholarship in anthropology, a convergent approach has emerged in decision theory, under the label of Naturalistic Decision Making (NDM) (Lipshitz et al., 2001; Zsombok and Klein, 1997). From different perspectives, EDM and NDM have both emphasized the importance of a qualitative and descriptive approach to complex decision making. NDM has focused attention on the proficiency of actors such as firemen and fighter pilots, in uncertain and risky situations, faced with time pressure, incomplete information, ill-structured problems and high stakes. Complex and compounded factors make classical decision analysis impractical or impossible. The NDM approach is quintessentially ethnographic: to investigate how “proficient decision makers” act in natural settings.

Our EDM invites farmers to conduct a self-inventory of resources (Figure 1). Three primary categories of resources are personal, material, and social. A fourth category, financial resources or money, lacks intrinsic utility but can sometimes (not always) be exchanged for substantive resources. To use the decision model, first ask “do I have the required resources” (personal, material, social)? If not, then ask “can I obtain the required resources?” and “how?” The answers involve the negotiation of exchanges or substitutions in the cultural setting.

Personal resources are motivation, talent, knowledge, and time. A deficiency of personal resources may be overcome through social investments by others (encouragement, social opportunity) and through self-development (education, experience).

Material resources are land, equipment, infrastructure, and herd breeding stock. Again, deficiencies may be overcome through a combination of financial, social and personal investment.

Social resources are a community environment; accessible markets; and marketing and production teams. The mark of strong social resources is an abundance of good will with neighbors, relatives, friends,

FIGURE 1. Self-inventory of resources required for a cattle enterprise, and suggested remedies for deficiencies.

Resource Type	“Do I have the required ... ?”	“How can I secure the required resources ...?”
Personal	Motivation Talent, Ability Knowledge Time	encouragement (social) experience (social); education, training (financial) education, experience (social, financial) withdrawal from other activities
Material	Land Equipment Infrastructure Breeding Stock	establish partnership or marriage (social) purchase or rent (financial); borrow or swap (social) purchase or rent (financial); build it yourself (personal); mutual aid (social); hire it done (financial) exchange bull service or cows (social); purchase cows, bulls, service (financial)
Social	Market Access Marketing, Production Teams Good Will	join coop or marketing alliance (social); establish partnership (social) hire specialists, helpers (financial); establish partnership (social) be neighborly, charitable (personal, social, financial); image advertising (financial)
Financial	Dollar Assets Income Credit	win lottery get an additional job persuade banker (personal, social, financial)

and clientele. To overcome deficiencies in social resources may require a substantial investment of personal and financial resources.

Personal Resources: Motivation, Time, Knowledge, Skill

A beef enterprise requires specific personal resources, including motivation, time commitment, knowledge, and skill. Motivation may involve life-style considerations, and family heritage, as much as financial returns. Given the motivation to farm, there are alternative systems to be considered, here the “conventional” or “pasture-finishing” beef enterprises. Depending on many factors, including farmer goals and resources, the financial rewards of pasture-finishing may or may not repay the effort.

Time commitment is a major consideration in choosing a beef enterprise system. Time requirements for both labor and management shift with the seasons. Seasonal stocker operations, or year-round continuous grazing at low stocking rate, impose generally lower time requirements. Marketing requires the most variable and potentially the largest time requirement, with pasture-finishing. Required efforts for marketing are very dependent on social resources including especially, access to a ready market.

Other personal requirements are knowledge and skills specific to cattle enterprises. For pasture-finishing, much of this is traditional grazing management expertise that has been somewhat lost with the rise of conventional feedlot production. The technology for pasture-finishing technology can be learned, or renewed, with the collaboration of farmers or others acting as mentors.

Personal resources that may be lacking can be developed through practice, training, education, and other means, but at a cost that must be considered.

Material Resources: Land, Equipment, Infrastructure, Herd

Material resources required for a cattle enterprise include land, equipment, infrastructure, and a herd of animals.

Suitable land from the production viewpoint means forage production and no higher agricultural use. Level, fertile cropland is not required. From a marketing viewpoint, suitable land means market access. For a pasture-finished beef enterprise, location near an urban market may offset higher land costs. Land might be owned, rented, borrowed, inherited, or farmed in partnership.

Appropriate equipment and infrastructure are required. Use of equipment can perhaps be obtained by swapping, if not by purchase or rental. Infrastructure such as fencing and water development may be obtained through personal or social investment (sweat equity, exchange labor), as well or better than by hiring it done by contract. Conventional producers may be over-invested in machinery (tractors, mowers, balers, etc.) and some infrastructure (confinement facilities, feedlots). A switch to pasture-finishing may fit in a strategy to sell, or to avoid purchasing, expensive equipment. At the same time, the switch may require new investment for example in fencing and water development to support a more intensive rotational system.

A suitable herd of cattle is required for breeding stock. Development of a suitable herd can be accomplished with a mix of personal, social and financial investments. Suitability is a matter of degree. All cattle

grow well on pasture. However, large-framed cattle selected for quick growth on grain bring a premium in the commodity market. These same cattle may not finish as well on pasture in comparison with smaller-framed, earlier-maturing animals which are discounted by feedlots.

Expenditure of money can compensate only partially for any shortage of material requirements. Often, personal and social resources must also be brought to bear in order to have access to land, equipment, and other material necessities.

Social Resources: Community, Markets, Teams

Social resources are features of an environment resulting from a web of relationships in a locality or vicinity. Social resources are fundamentally of geographical and face-to-face origin, but have been considerably extended through technology. In general, to be situated and well-connected in a vital and healthy community is a very valuable social resource.

The community includes other producers and consumers, and others in the roles of partners, friends, and neighbors. The key to community is generalized reciprocity, involving an exchange of all sorts of goods and services without explicit calculation of costs and benefits (Mauss, 1925). Farmers can consult and otherwise share with one another, benefiting in both production and marketing. When producers market directly to consumers, the relationship can be developed into more than a mere commodity exchange. This is the philosophy behind “consumer-supported agriculture” (CSA). In many rural communities, market support for local producers has dwindled. Wider regional and even global networks of farmer mutual aid can compensate somewhat in such circumstances.

A market is a social resource, whether local or global. In order to capture a larger share of the retail dollar, pasture-finished beef must be sold more directly to the retail consumer. Local direct marketing is less costly than packing and shipping at a distance. Market development may require concerted effort by leading producers. Strategies for improvement of poor market access can include cooperative marketing, custom packing and shipping, and development on the Worldwide Web and e-mail communications.

In an enterprise, there must be teamwork to accomplish the labor and management tasks in both production and marketing. A traditional farm division of labor is between a husband (production) and wife (marketing, home economics). Of course there are many exceptions. However

formed, to keep a team together and occupied year-round may require a mix of seasonal enterprises. An off-farm job may be part of the mix. Pasture-finishing may require a full-time on-farm worker, whereas a part-time commitment may suffice for commodity beef, a monocrop, or another single enterprise.

If social resources are severely lacking, the investment of financial resources may be insufficient to overcome the shortage. Spending money cannot secure the existence of a community, a market, and an enterprise team. Personal and social investments (cooperation, marketing alliance) are required. Marketing efforts involving partnership are likely to be more economical and effective than hiring a market specialist. Likewise, in production, there is a trade-off between partnership or work exchange on the one hand, and hiring of help for pay on the other hand. The purchase of good will through image advertising is expensive and not likely to be more effective than neighborly and sociable direct action.

Financial Resources: Liquid Assets

As suggested earlier, no amount of wealth can literally substitute for essential personal, material and social resources. Money is useful only to the extent that the essential resources can be obtained through purchase or rent. Material resources may be fairly easy to buy with dollars, but in purely financial terms the return on investment may not be optimal. Despite their critical importance, personal and social resources cannot be so easily bought, and the returns on such assets cannot be easily measured.

DISCUSSION

A descriptive approach to decision making does not lead to a definite prediction or recommendation. Instead, it aims to inform a decision maker about relevant cultural experience affecting others who have faced similar decisions. This approach has been labeled “naturalistic” or “ethnographic.”

Farmers may have seasons and days in which to plan ahead, but like firemen and fighter pilots their decisions are complicated by factors of time pressure, incomplete information, ill-structured problems, and high stakes. These factors defeat the possibility of a prescriptive model of choice. Prescriptive models require well-framed problems. Framing

is a cultural and perhaps an ethnographic process. Agricultural enterprise decisions, and other major management decisions, are not well structured or easily framed.

The task of management is to control factors of production and marketing, and not to simply substitute given costs and coefficients in a mathematical model. Control is achieved by applying cultural knowledge in situations which are more or less understood from personal experience or tradition.

Diversification of a cattle enterprise to serve the pasture-finished beef market as well as the commodity system can be an attractive opportunity for a cattle producer with the appropriate mix of resources. The portfolio approach (diversification) may offer reduction in total farm livelihood risk and uncertainty. To implement the approach, the herd is classified into two groups, destined either for the niche market or for the commodity market. The pasture-finished group always receives preference. In an average or good growth year, available forage is allocated to animals in both classes. In a bad growth year, the higher-valued animals destined for the niche market are put "out front" while cattle destined for the commodity market get second-best.

In summary, the decision to finish cattle on pasture cannot be reduced to a prescriptive formula. What is required, for actual proficient decision making, is a rich description and awareness of the situation, with reference to personal, material and social resources. Our ethnography provides a guide to understanding cattle enterprise decisions, but falls short of full situation awareness. In each of our four farm case studies, individual situations are mentioned which go beyond the general framework of our EDM.

Through ethnographically relevant details and examples, we have introduced readers to the culture of cattle enterprises, thereby framing and informing the decision to finish cattle on pasture.

REFERENCES

- Barlett, Peggy F. 1989. *Agricultural Decision Making: Anthropological Contributions to Rural Development*. New York: Academic Press.
- Bernard, H. Russell. 2002. *Research Methods in Anthropology*. Walnut Creek, CA: Altamira.
- Bryan, W. B. and T. A. Mills. 1988. Seasonality of Pasture Growth in West Virginia. *Proceedings of the 12th General Meeting of the European Grassland Federation*. Dublin, July 4-7.

- Cancian, Frank. 1989. Risk and Uncertainty in Agricultural Decision Making. *In* Barlett 1989:161-176.
- Cashdan, Elizabeth. 1990a. *Risk and Uncertainty in Tribal and Peasant Economies*. Boulder: Westview Press.
- Cashdan, Elizabeth. 1990b. Introduction. *In* Cashdan 1990a:1-16.
- Dreyfus, Hubert L. 1997. Intuitive, Deliberative and Calculative Models of Expert Performance. *In* Zsombok and Klein 1997:17-28.
- Gladwin, Christina. 1980. *Ethnographic Decision Tree Modeling*. Newbury Park, CA: Sage Publications.
- Gladwin, Christina. 1989. A Theory of Real-Life Choice: Applications to Agricultural Decisions. *In* Barlett 1989:45-86.
- Gladwin, Hugh and Michael Murtaugh. 1989. The Attentive-Preattentive Distinction in Agricultural Decision Making. *In* Barlett 1989:115-136.
- Goodenough, Ward Hunt. 1963. *Cooperation in change*. New York: Russell Sage Foundation.
- Hardaker, J. B., R. B. M. Huirne, and J. R. Anderson. 1998. *Coping with Risk in Agriculture*. New York: CAB International.
- Hoben, Allan. 1989. Agricultural Decision Making in Foreign Assistance: An Anthropological Analysis. *In* Barlett 1989: 337-370.
- Johnson, Allen. 1989. The Limits of Formalism in Agricultural Decision Research. *In* Barlett 1989:19-44.
- Lipshitz, Raanan, Gary Klein, Judith Orasanu, and Eduardo Salas. 2001. Focus Article: Taking Stock of Naturalistic Decision Making. *Journal of Behavioral Decision Making* 14: 331-352.
- Lozier, John, E. B. Rayburn, and Jane Shaw. 2004. Growing and Selling Pasture-Finished Beef: Results of a Nationwide Survey. *Journal of Sustainable Agriculture* 25:2.
- Mauss, Marcel. 1925 [1954]. *The Gift: Forms and Functions of Exchange in Archaic Societies*. Translated by Ian Cunnison. London: Cohen and West.
- Rayburn, E. B. 2003. Production Risk of Cool-season Grasses in the Northeast United States. *American Forage and Grassland Council*. Lafayette, LA. April 27-30.
- Zsombok, Catherine E. and Gary Klein. 1997. *Naturalistic Decision Making*. Mahwah, NJ: Lawrence Erlbaum Associates.

RECEIVED: 05/24/04

REVISED: 12/28/04

ACCEPTED: 01/24/05