Outside the Box

by **TOM FIELD,** *professor of animal science, Colorado State University*

Developing an early warning system

It is embarrassing to admit it, but the "low on fuel" message light on my dashboard screen has saved me some long walks. One would think that it would be second nature to check the fuel gauge, but somehow, in the hectic pace of life, I need the more visible reminder provided by the little yellow light that reminds me to tend to the details of keeping an internal combustion engine on the move. My dashboard also reminds me when to change the oil and several other housekeeping items that reduce wear and tear on my vehicle, my budget, and my time.

Wouldn't it be great to have the same dashboard system for a cow herd? Actually, such a system is possible to create if there is a willingness to collect data over the long haul and to put it to use in management decision-making. The basics of an ideal warning-light system would include the following components.

- Calving season distribution
- Pregnancy rates for young cows weaning their first calf
- Changes in percent calf crop weaned
- Body condition score (BCS) trend in the 60-90 days prior to calving
- Annual cow costs

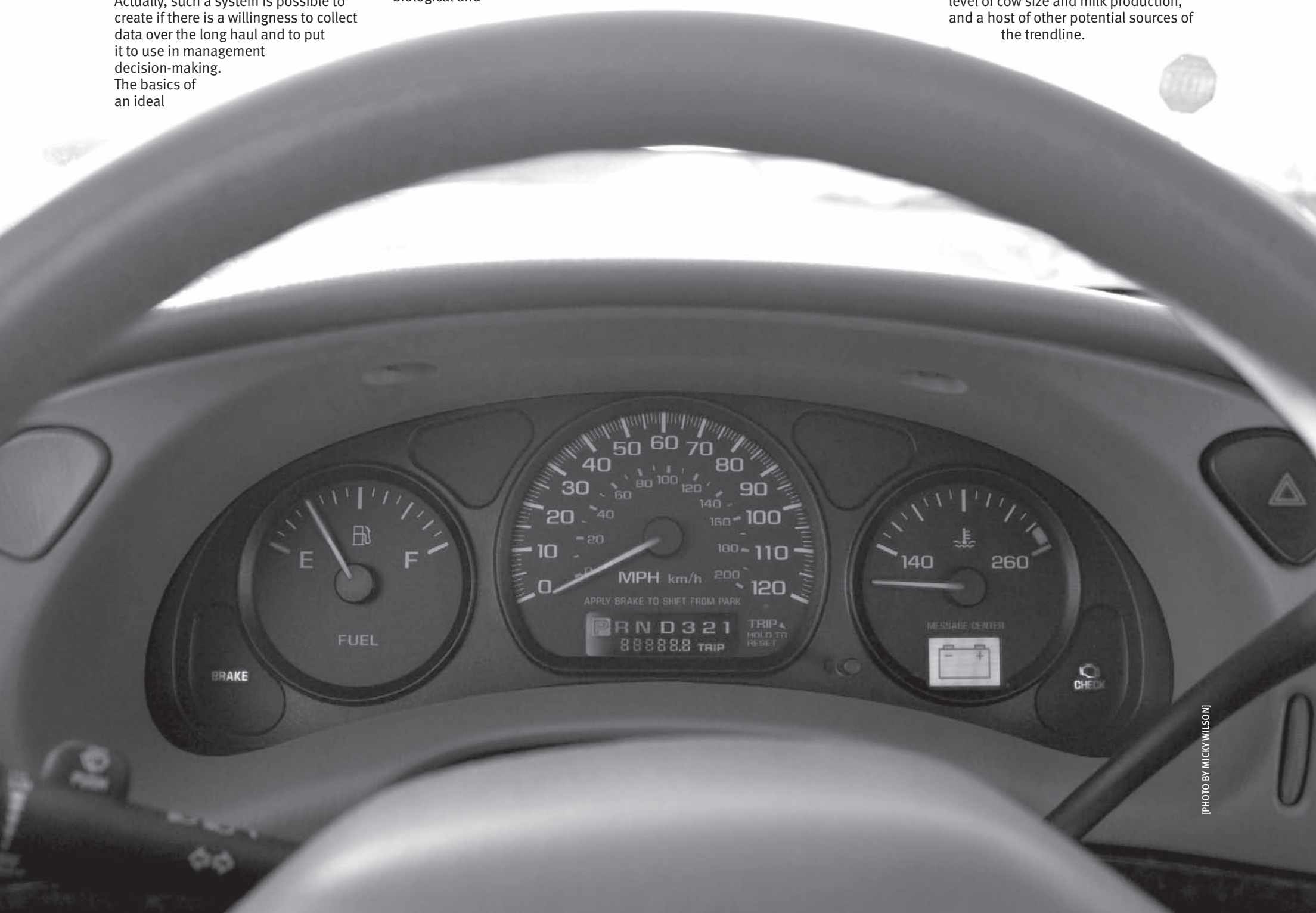
Each manager will find that some of the five fit, while others should be discarded in favor of more appropriate indicators. However, these five meet my criteria of providing early warnings about subtle changes in both biological and economical trends that can be reversed with decisive action before they become full-blown crises.

All five recommendations are based on an important assumption — multiple years of data are required to get the system fully operational. Data from a single year are unlikely to provide the depth of insight required to determine if corrective action is required. But data compiled over several years begin to provide meaningful trends that can be analytically evaluated.

Susceptible performance

Reproductive performance is sensitive to changes in forage availability relative to animal requirements, disease and excesses in selection. Thus, my list has four reproductively related warning signals — calving season distribution, fertility of females nursing their first calf, percent calf crop weaned and trends in BCS.

Subtle but important change in calving season distribution is a decent signal of potential trouble. For example, if a three- to five-year evaluation of the percent of calves born in each 21-day period of the calving season shows a strong tendency for more calves to be born later and later in the season, then it is prudent for the management team to take a more in-depth look at the herd health program, cow herd nutrition, level of cow size and milk production, and a host of other potential sources of the trendline.



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Given the intensity of management most yearling heifers receive, it isn't a surprise that most of them manage to get bred. The real test comes in the next year when a cow is breeding back for her second pregnancy. Pregnancy rates for second-calvers may be diminished because heifers are too big, are milking too much, or had difficulty during their initial birth.

It would be rare for a female to be able to turn a profit on her first calf in light of the cost of her own development. In fact, most economic models suggest she won't turn a profit to the enterprise until her third or even fourth calf is sold. Thus, failure to rebreed in a timely fashion either ruins her ability to be profitable or delays her profitability, which transfers more of the burden to her herdmates.

Percent calf crop weaned is an excellent overall barometer of the total fertility of a herd as it captures losses due to cows failing to become pregnant, failing to carry the pregnancy to term, and the mortality rate of calves prior to weaning. Tracking this trend is a very appropriate approach to the total productivity of the cow herd.

Concurrently, BCS provides a measure of the herd's ability to be productive on the available feed resources. Cows in a declining state of condition in the two to three months prior to calving require short-term attention if they are to be expected to produce adequate milk, provide excellent maternal antibody protection to their offspring and breed back early in the next season.

While a nutritional management change may be required, producers should go the next step and ask themselves whether or not the production cycle is in harmony with the availability of green forage and whether the selection program is favoring cattle that are not in synchronization with the ranch's environment.

Monitor costs

The final component of my early warning system is annual cow cost, specifically trends in feed costs and expenses related to equipment and facilities. The advantage of a ruminant animal to an agricultural system is its ability to graze and to turn plants with high cellulose content into a highly palatable protein source for human consumption. The challenge is to keep our selection pressure and management protocols focused on this strategic advantage.

At the end of the day, feed costs account for approximately two-thirds of the variable costs associated with beef production. It only makes sense that monitoring this indicator will help managers stay oriented to the task of making maximum use of the highly renewable forage resource.

Given the high cost of fuel, equipment and facilities, this is another area deserving of significant attention. Acquisition and maintenance of depreciable assets can overwhelm the profit potential of an enterprise. When it comes to equipment and facilities, the challenge is to balance true need with convenience. Measuring the total cost of maintenance and repair is a critical step, but management precision can be improved by knowing the cost of operation, ownership and maintenance of each major piece of equipment.

As the cattle cycle makes its inevitable downward turn following the last near decade of significant profitability, the incorporation of early warning systems can significantly improve the responsiveness of managers and help to assure that profitability can be protected.

Editor's Note: *Tom Field is a professor at the Colorado State University (CSU) Department of Animal Sciences, where he is responsible for the seedstock cattle breeding program of the university teaching herd, composed of Angus and Hereford cattle. He directs the Seedstock Merchandising Team and teaches Food Animal Sciences, Beef Production and Family Ranching. He is a contributor to the research efforts of the CSU Beef-Tec program. A frequent speaker at beef cattle events in the United States and internationally, Field is also a partner in his family's commercial cow-calf enterprise, which uses Angus as an important genetic component.*