

## **KNOW THE GAME YOU'RE PLAYING**

J.D. Rhinehart

Department of Animal Science, University of Tennessee-Knoxville

“A finite game is played for the purpose of winning, an infinite game for the purpose of continuing to play.” – *James P. Carse*

“If you study people who succeed, you will see that most of them follow systems, not goals.”  
– *Scott Adams*

### **INTRODUCTION**

Welcome to the 2019 Applied Reproductive Strategies in Beef Cattle symposium. The objective for this meeting is to provide information you can take back to your farm, ranch, veterinary practice, or educational programming and apply in a way that improves your, or your cattle-producing clientele's, profitability and quality of life. As the meeting title indicates, the presentations and lab sessions will focus on translating research findings into management applications. To set the stage for using these practices in the most effective way for your specific situation and environment, the aim of this first presentation is to stimulate thought about the long-term implications of the decisions you make around reproductive management in your cow herd.

To be more straightforward, this discussion is intended to help decision makers break away from the habit of making choices that focus only on immediate outcomes, and to develop a habit of considering how a decision today could affect profitability in the following year or even for future generations. Viewed from that perspective, a rancher might make a decision this year that does not achieve the highest possible pregnancy rate, or that might seem like an antiquated approach, if it creates the opportunity for sustained and adequate pregnancy rates in future years. Similarly, they might choose not to adopt the most cutting edge technologies of the time if it means sacrificing other opportunities in the future. Decisions can change from counterintuitive to completely logical when the scope of consideration is widened or the timescale is extended into future generations.

A method for making decisions the yield better long-term outcomes is to apply Game Theory – a discipline in mathematics that is not often considered in livestock production. Game Theory is more often applied to economics, computer science, and social science because it deals with strategic decision making. However, methods for rational and strategic decision making can, and should, be applied to cattle management. Moreover, since reproductive performance is the single most important factor for profitability in cow-calf production, it is imperative that a long-term perspective be taken when making decisions about the application of advanced reproductive technologies.

### **GAME THEORY**

Game theory can be divided into two distinct applications; competitive or cooperative game theory. Competitive game theory helps understand the interactions of decision-makers that interact strategically while cooperative game theory helps find the best way to distribute value among a group that pools their resources to create that value. For this discussion, the focus is on

using competitive game theory. While cattle producers do not necessarily think of being in a competition with every other cattle producer because there are so many players in the market. But, it is important to recognize that there is a limit to beef consumption that essentially makes each producer a competitor with every other producer for that limited market.

Simon Sinek, author of the book *Leaders Eat Last*, describes how competitive game theory can inform decision making in business. Sinek breaks down competitive game theory into two more categories; finite or infinite games. He explains that finite games have parameters that are known by the players before they enter the game.

Finite games have a predetermined start and end time, agreed-upon rules that regulate activities during that time, and predetermined players (other players do not enter and exit during the game. Examples of finite games are found in what comes to mind when we think of the term “game” as it is normally used. For instance, a football game is an example of a finite game. There are only two teams, a set number of players for each team, it is limited by time, and there is a clear winner at the end of the game. The objective of each team and each player is to be the winner at the end of the game.

Infinite games, in contrast, are different in several key ways. Infinite games do not have a predetermined end, the rules change over time, players enter and exit the game as it progresses, and there are no rules by which to keep score. In general, business is a good example of an infinite game. Businesses are playing the game to sustain success for as long as possible, rather than playing to win each year or any single component of a market in which they operate.

### **KNOW THE GAME**

It might not be clear at this point in the discussion why it is important to understand game theory, or how it applies to cattle production. Farming and ranching, even though they uniquely constitute a lifestyle more than most other businesses, they are as much a business as the production of any other commodity or technology. The fact that most people involved in beef cattle production do see it as a way of life makes it even more imperative that it be viewed as an infinite game. One in which the objective is not to have the highest possible pregnancy rates in a given year or to wean the absolute most possible pounds of calf per cow exposed. Rather, decisions are best made from the perspective of how they will impact the current production cycle (i.e. year) in combination with how they will impact the following year and even the next generation that will take over the operation.

As mentioned in the introduction, taking the infinite perspective might lead to counterintuitive decision making relative to attempting maximum production in a single year. For example, investing excess supplemental feed resources into virgin heifers can achieve very high conception rates in the initial breeding season, but lead to lower than profitable pregnancy rates and protracted calving distribution for rebreeding as two-year-olds. Continually losing two-year-olds year after year, before they have recouped the cost of their retention and development, makes it difficult to realize profit in beef cattle production. That, along with the increased cost of development, can lead to an early exit from the infinite game of cattle production unless external resources or cash are continually injected into the system. Continually using external resources to maintain the game changes it, by definition, from a business to hobby.

### **REFERENCE**

Sinek, S. 2018. *Leaders eat last*. Portfolio Penguin; London, England.