Pardalis Software, Inc.

A New Information Marketplace for the Beef Industry

A White Paper Introducing Common Point Authoring™ and Its Capabilities

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About Pardalis's Authors and Patents

Steven L. Holcombe and Dr. Marvin L. Stone are co-inventors of the parent patent describing the Common Point Authoring™ system, issued December 30, 2003, entitled *Informational Object Authoring and Distribution System*, and bearing USPTO Patent Number 6671696.

Steven L. Holcombe, Dr. Marvin L. Stone, and Kathleen D. Legako are co-inventors of the USPTO continuation patent application entitled *Common Point Authoring System for Tracking and Authenticating Objects in a Distribution Chain* and filed with the USPTO in October 2003.

Steven L. Holcombe is the Chief Executive Officer of Pardalis Software, Inc. Scot D. Holcombe is the Chief Financial Officer and a Director of the corporation. Kathleen D. Legako is the Chief Technology Officer. Dr. Bill R. Clay is a Director of the corporation.

A New Information Marketplace for the Beef Industry

Introduction

Production supply chains depend on more than just goods, materials, and processes. They also depend on information. Information tells producers when to purchase, how to manage operations, whether costs are under control, and much more. Increasingly, information is seen as a commodity in its own right, the product of an *information supply chain*.

In the beef industry, the value of information has never been clearer. The United States Animal Identification Plan, Country of Origin Labeling, the recent U.S. case of bovine spongiform encephalopathy (BSE) – all speak to the value of accurate, traceable livestock information. Equally valuable, if less well covered in the news, is information about genetics, feeding, growth, health, yield, and other measures of quality.

As a beef producer, you know the value of your cattle and cattle products. But do you fully appreciate the value of the information you produce? Are you maximizing your revenues by treating cattle information as the marketable commodity it is?

Pardalis Software is committed to helping beef industry producers – cow-calf operators, sale barns, stockers, feedlots, and packers – do just that.

A patented new technology from Pardalis – **Common Point Authoring™**, or CPA – will provide producers throughout the beef industry supply chain with a new, low-cost means to own, exchange, and profit from the information they produce. Pardalis is now developing a solution based on CPA that creates a **New Information Marketplace** for the beef industry.

Regardless of the type or size of your operation, or the technologies you currently employ, the New Information Marketplace will empower you to:

- Increase your income by controlling and selling your information in an open market
- Know that your information transactions are always secure and private
- Achieve safety and quality goals with better information from suppliers and buyers
- Join an industry-wide marketplace with *no* cost for hardware or software

Like the cattle and beef you produce, your information has monetary value. In the New Information Marketplace, you and producers throughout the industry will be able to buy, sell, trade, and share that valuable commodity to improve your profitability.

The next few pages will look at the question of information in the beef industry and then describe the two core aspects of the Pardalis solution – its new low-cost, Internet-based communications model and the patented Common Point Authoring technology that will enable the New Information Marketplace and participating producers to thrive.

Information and the Beef Industry

The beef industry is changing radically, and as long as technologies like controlled genetics, electronic ID tagging, and computerized information management continue to boost efficiency and economy, the evolution will continue – or even accelerate. Despite these advances, open communication across the industry and corresponding improvements in safety and quality have yet to be attained.

The Fragmented Information Supply Chain

The U.S beef industry is a complex supply chain, stretching from coast to coast, handling over 100 million head of cattle annually, and including tens of thousands of cow-calf operators, sale barns, stockers, feedlots, and packers – not to mention grain producers, veterinary professionals, distributors, and other service providers who support the industry.

Because of this complexity, the beef information supply chain is fragmented, as illustrated in Figure 1. Information tends to move in small steps, across only one or two segments, and along narrow channels defined by established relationships. A feedlot, for example, might buy from – and exchange information with – the same few stocker-operators for years, never exploring potential opportunities that other producers might provide.

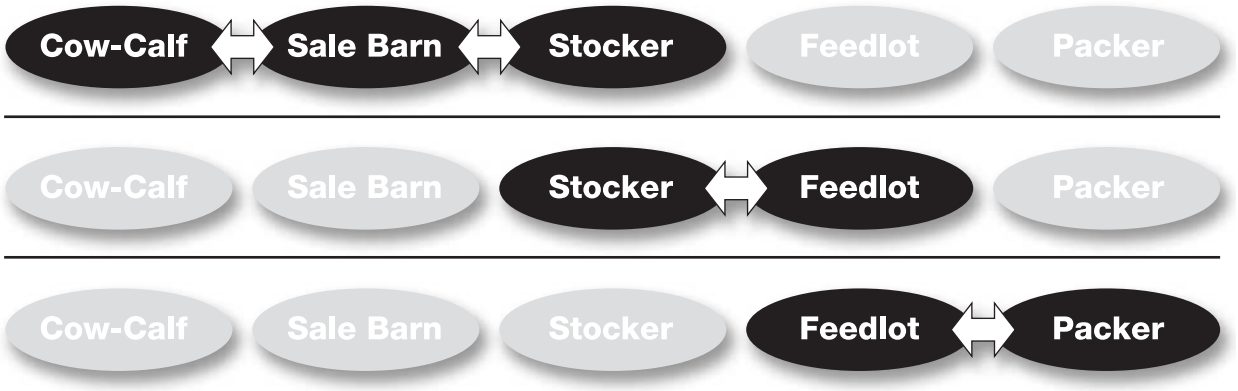

Figure 1. The Beef Industry's Fragmented Information Supply Chain

Compounding this fragmentation is the proliferation of computer systems. While any system will improve a producer's ability to manage his or her operation, the proprietary nature of hardware and software has raised barriers to communication. Incompatible data formats and protocols often create a need for new integration programs or more professional support, ultimately adding rather than cutting costs. In today's market, where pressure to maximize cattle health and quality is increasing, fragmented communication no longer does the job.

Connecting the Information Supply Chain

A connected information supply chain would provide significant benefit to the industry, allowing producers to communicate with potential new partners, develop new relationships, gain competitive advantage, and increase revenues. The New Information Marketplace creates such a connected chain, enabling the exchange of accurate, traceable, profitable information with many producers in multiple segments. Figure 2 illustrates one of many examples – in the connected Marketplace, any cow-calf operator, sale barn, stocker, or packer could also be the center of a communication hub.

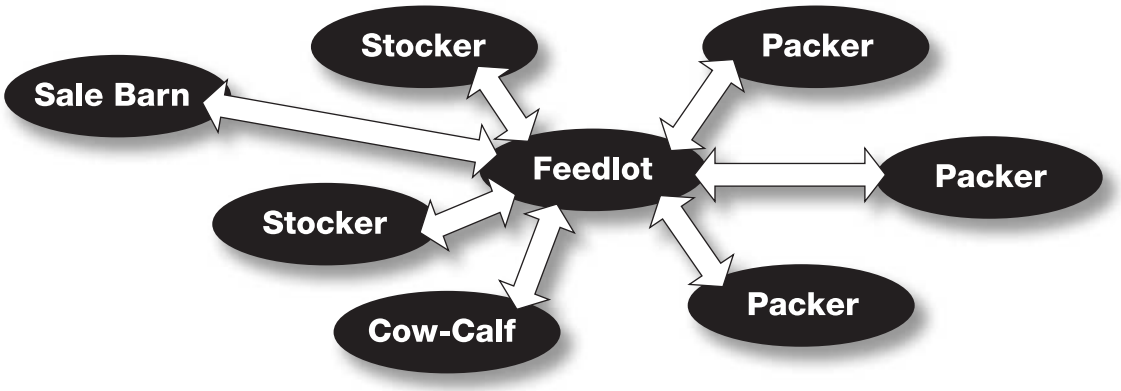

Figure 2. A Connected Information Supply Chain (Feedlot Example)

Two additional examples help demonstrate how a connected supply chain creates opportunity:

Grid Rankings and Quality Goals

Major meat packers rank carcasses according to quality and yield grade grids. Based on these rankings, packers set the prices they pay to the feedlots and influence prices paid to stockers and breeders. Yet many of the suppliers know nothing about rankings of individual cattle but only the rankings of the whole lots.

Grid pricing is an informational tool, and it stands to reason that its value will be maximized when the value of the information is maximized. That can happen when the grid information – in all its detail – is made available in a value-driven market. With detailed grid information available in the New Information Marketplace, feedlots or stockers can improve the marketability of their cattle by optimizing production and quality and sorting out lower performers before sale.

What Mad Cows Tell Us About Health Information

The case of BSE in Washington State is as much about the value of information as animal health. After discovery of the disease in a single cow, it took authorities several days to find the feedlot it came from, then several more days to trace the cow's point of origin via DNA testing. The USDA is still trying to track down other cattle from the premises that handled the infected cow.

With an active industry-wide information marketplace, reliable, verifiable information about source, health history, condition, even feeding history – associated directly with an animal's ID – will always be available and quickly traceable. Every producer with any stake in the diseased animal is already linked to the communication chain.

In the mad cow aftermath, the beef industry has an opportunity to control its own future. Cooperative, industry-controlled management of cattle information in a New Information Marketplace extending across international borders would be a significant step toward self-regulation and proactive compliance.

The New Information Marketplace

Pardalis's Common Point Authoring technology enables a new model for information exchange in the beef industry – the New Information Marketplace. Producers of any size will be able to join the marketplace without any expenditure for new systems. Money changes hands only when seller and buyer agree to exchange information, whether about herds or single animals. Most important, whoever produces information owns that information and controls its sale.

The "Book" on Every Bovine

The commodity in the New Information Marketplace is an authoritative "book," a collection of information tracing the history of each animal in a herd. Normally, information will be recorded for herds as a whole (directly from a chute-side scanning system, for example), though entries for individual animals are possible. Similarly, information can be shared at any level – from herd to individual animal.

Each producer who handles an animal authors his or her "chapter" with information of value in the marketplace – about source, ID, feeding, growth, immunization, yield grade, quality grade, etc. If there is a need to source an animal from origin to harvest, and the animal is sold three times, passing through four premises, its book will contain a minimum of four chapters – one by each producer-author. If end-to-end sourcing is not required, a producer might only sell his or her chapter to the animal's next owner.

All information is owned by the producer who authors it, and the producer-author has full rights to sell chapters, smaller pieces of information, or no information at all. Authors can also sell or assign rights to another producer.

Common Information Repository, Low-Cost Internet Access

The New Information Marketplace offers a new model for information exchange, designed specifically to eliminate costs for everyone who participates and provide them with an opportunity to thrive.

Pardalis will maintain a centralized data repository on behalf of participants where Marketplace information will reside. Authors and information buyers will access the repository via the Internet. An intuitive, lightweight web front-end will make the system easy to use and accessible even from slower computers or wireless devices. In partnership with other technology vendors serving the beef industry, Pardalis plans to offer other low-cost authoring and access alternatives as well.

In addition to maintaining information from across the industry, the scaleable Pardalis system will record, invoice, and track all information transactions.

Enhancing the Power of Existing Systems

Realizing that many producers have investments in technology systems and the information they contain, Pardalis has designed its system according to open standards. Pardalis servers will be compatible with existing ID and information management programs, and producers will be able to export data to the New Information Marketplace via standard protocols.

Moreover, producers will add value to and extend the capabilities of their existing systems by connecting them to the Marketplace – with no need to purchase new equipment, maintain new systems, or resolve compatibility issues.

Common Point Authoring: Own, Market, Trace

> ***Linking the Food Chain: A Multi-Client Study***
> Sparks Companies, Inc., November 2002
>
> Data protection will be important to a trace back initiative. Specifically, the initiative will require investment in the collection, maintenance and distribution of factual data on the 'who,' 'what' and 'where' of food origin, composition and handling. Protection of this data from unauthorized copying will encourage the data collectors to expend the effort and resources required to collect the data and maintain the database.
>
> (Reprinted with permission)

For the first time, Common Point Authoring extends the concept of digital rights management (DRM) to authors and the authoring process.

Digital rights management is concerned with protecting intellectual property, in the form of digital information, by controlling permissions to buy, play, share, or use the information in other ways. Historically, DRM has focused on finished information – a recording in MP3 format, a market report from a financial analyst firm, a digital document available to subscribers, etc.

Common Point Authoring adds another level of protection, significantly more effective than password systems, assigning rights to multi-authored information at each stage of its creation – a need acutely felt in many fragmented information supply chains.

Ownership, Privacy, and Control

Rights-based authoring ensures that producers will digitally protect their part of the total information product – their "chapter" in the overall "book." This protection in turn secures ownership and guarantees control over sale and distribution. By means of authoring rights management, Common Point Authoring enables the New Information Marketplace, which is both open – everyone can participate – and secure – no one can participate without authorization.

In this marketplace, a stocker can author chapters on his beef cattle, sell them along with the cattle to fulfill a partner-feedlot's request for traceability information, offer them to new feedlots or packers as part of a business development effort, or sell them to cow-calf partners who need accurate information to measure the long-term performance of their cattle. Or the stocker can sell no information whatsoever, choosing to keep his records private.

Unalterable, Trustworthy Information

A critical characteristic of Common Point Authoring and the New Information Marketplace is the un-alterability of authored information. Once information is entered into the CPA system, it cannot be changed, even by its original author. Authors can, however, add supplementary information or comments that correct errors in earlier entries.

Whatever paths it takes in the New Information Marketplace, all information can be guaranteed to be authoritative and trustworthy.

Traceability

A key result of author-ownership and unalterable information is the ability to precisely trace verifiable information back to its source and forward to all its recipients. In the CPA system, books, chapters, and all informational elements are uniquely traceable.

Normally, tracing will only be possible by authors and others to whom authors assign appropriate rights; however, government authorities could trace information through the same judicial or administrative processes required to search any property.

A Technology for Industry Applications

On December 30, 2003, the United States Patent and Trademark Office issued a patent to Pardalis Software for its **Common Point Authoring** technology. A second, continuation patent for a CPA solution specifically for the livestock industry is now pending with the USPTO.

Common Point Authoring represents an evolutionary advance in the ownership and owner-controlled exchange of information and is broadly applicable to the management of digital information in many industries.

Common Language, Industry Standards

In complex information supply chains, there is inexorable pressure to standardize data types, formats, and authoring functions. The reason is simple. In such environments, lack of standardization hinders communication. Yet in the world of proprietary systems, efforts at standardization require substantial expenditures.

Pardalis's CPA technology changes the equation between standardization and cost. At the heart of CPA is a common vocabulary, common forms, and common database categories that all producers throughout the industry will be able to use from the outset. In addition, authors will drive the addition of new terms to the vocabulary as they are required.

Moreover, in the CPA system, standardization is driven by the entire marketplace, not by regulatory agencies or large companies with the leverage to make smaller businesses subscribe to their systems.

Conclusion: The Value You Gain

Common Point Authoring and the New Information Marketplace put an absolute premium on the ownership of information, the privacy of the producer-author, and the author's ability to sell his or her information at fair market value.

Through Common Point Authoring, Pardalis wants to empower cattlemen and others in the extended beef supply and demand chain to create a unified marketplace, managed by the industry itself, where trustworthy, traceable information becomes a commodity that generates real revenue for beef producers and prosperity throughout the industry.

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PardalisBeef Data Banking Service™

Pardalis™

The PardalisBeef Data Banking Service™ is the **national bank for cattle data** – the only data banking and sharing service where every producer in the industry can own his own **private data safe deposit box** inside the central vault. The PardalisBeef Data Banking Service – *PardalisBeef* – connects the industry and protects the producer.

National Data Bank
Central national vault for storing ID, source, and process data – and sharing with others you do business with.

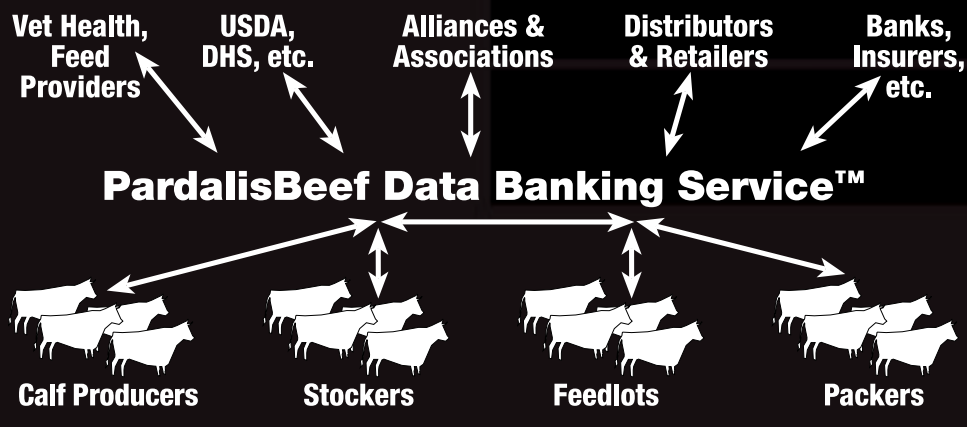
Private Safe Deposit Boxes
Protect producer privacy and data confidentiality.

Easy Online System
Deposit, certify, or share data with a few mouse clicks in an easy web interface.

Compatible Technology
Export data from any ID, data collection, or cattle management system; add value to existing systems.

Lowest Cost
PardalisBeef is centralized and web-based; you spend nothing on new hardware or software.

Revenue-Generating
Trade high-value source, age, and process information along the supply chain.



Trade, Track, Trust

PardalisBeef empowers you to **trade your data** with producers you select, **track your data** anywhere it goes, and ***trust*** **your data** because you certify it, you control it, you own it.

Trust means your information remains private and confidential until you choose to share it. Patented technologies allow you to certify your data, so it can never be altered, and grant specific permissions for others to view or use it.

Track means you know where your data goes. Every piece of data gets its own unique identifier – your data will always carry *your brand.* PardalisBeef tracks your cattle *and* your data.

Trade means you choose any part – or all of it, or none of it – to share with another producer. And when you share, you can expect valuable information in return to improve your operations and the quality and safety of your beef product.

Pardalis Partner Program

Pardalis is seeking **industry partners** to introduce PardalisBeef into the beef supply chain and **technology partners** to help link producers to the national data banking and sharing system. Early partners receive premium technical and marketing support, preferred pricing, and first-mover advantage with this revolutionary way to connect the industry and protect every producer.

PardalisBeef Data Banking Service™

Pardalis™

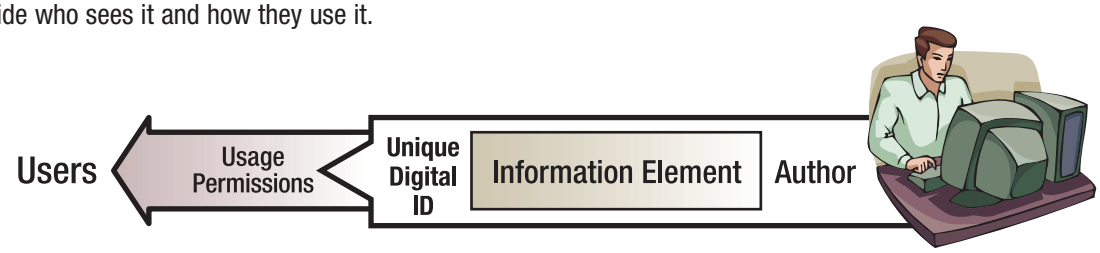
Common Point Authoring™ System

The Common Point Authoring™ (CPA) System is the technology architecture underlying the PardalisBeef Data Banking Service™. It is designed from the ground up to meet the information privacy, sharing, and traceability needs of industries with thousands or even millions of information producers.

FEATURE	FUNCTION
Centralized, nationally scalable data service	Provides safe deposit for hundreds of millions of records, handles millions of sharing transactions
Internet access (browser-based and Web services)	Ensures that all producers – large and small – can use PardalisBeef easily and economically
Many-to-many information sharing	Allows information producers to share or license data to any other PardalisBeef member
Technology compatible	Connects your ID, data collection, or cattle management technology to the national service
Data tracking and audit log	Protects service members by permanently recording information movements and transactions

Author-Level Digital Rights Management™ (A-DRM™)

The linchpin technology inside the CPA System – and PardalisBeef – is Author-Level Digital Rights Management™ (A-DRM). The name means you now own the information you author. A-DRM empowers you to control your data. You decide who sees it and how they use it.



As an information element is recorded in the system – e.g., an animal's feeding and weight-gain history – A-DRM puts the information in a digital lockbox and assigns it a *unique digital identifier* "key." With your key, you control how your information is distributed and grant permission for its use.

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Pardalis Turns Traceability to Profitability

WHEN IT COMES TO INFORMATION ISSUES facing the beef industry, the National Animal ID System (NAIS) grabs most of the attention. Beef producers anticipate spending more time and more money keeping up with new ID and trace-back technologies, figuring out new computer systems, and merging their records with state and national systems. There's little doubt that the national ID and traceability system will cut into the bottom line. But that's only the flip side of the coin.

Pardalis Software, a company based in Stillwater, Okla., has introduced a model for turning the "cow's ear" that is NAIS into a silk purse for the nation's beef producers.

In January, during the Cattle Industry Annual Convention, Pardalis announced its New Information Marketplace for the Beef Industry, currently in development with availability anticipated in early 2005. The system will provide a marketplace where cattlemen and others who produce information about beef and beef production can securely buy, sell and trade their information.

The goal of the Beef Information Marketplace is simple. Turn a national compliance burden into a new opportunity for boosting revenues and profits – for every producer in the industry.

The thinking behind the Marketplace is simple as well. Cattlemen produce high-value information – about genetics, feeding, growth, health, immunization, yield, quality and so on – and an industry-wide traceability system based on individual animal identification offers an unparalleled opportunity to capitalize on that information value. To make it happen, what's required is a system that is both open – providing avenues of communication throughout the supply chain – and controlled – ensuring that producers retain ownership of and control over their information until they choose to offer it for sale or trade. Based on patented new technologies, the Beef Information Marketplace is the only system that fits the bill.

One of the more compelling examples of high-value information that can be turned into profits for producers are packinghouse price grids and price-grid reports.

Reporting by lot

To feedlots, the carcass grid report directly impacts success and profitability. It tells them how much they earn per lot and how each lot has fared in terms of quality and yield. As we'll see, however, better information, on an individual animal level, would help feedlots and their suppliers make better management decisions and increase revenues. The Beef Information Marketplace is designed to provide better information.

	Yield Grade (YG)				
Quality Grade	**1**	**2**	**3**	**4**	**5**
Prime	11.00	9.00	6.00	-14.00	-19.00
Choice	5.00	3.00	Base	-20.00	-25.00
Select	-1.00	-3.00	-6.00	-26.00	-31.00
Standard	-11.00	-13.00	-16.00	-36.00	-41.00

Table 1. Typical Price Grid

In a price grid like this (adapted from Feuz, Ward, and Schroeder, "Understanding Grid Pricing," Managing for Today's Cattle Market and Beyond, March 2002), carcasses are ranked according to yield grade and quality. The green shaded cells are the "premium grids." For a carcass rated at Prime/YG2, the packer pays $9 above the base price per hundredweight. For a 750-pound carcass, this rating amounts to an overall premium of $67.50. The red shaded cells are the "discount grids." If a carcass ranks in one of these, the packer reduces payment by that amount per hundredweight.

Normally, it's in the feedlot's best interest to produce more animals that land in the premium grids. At present, however, it's not always easy for feedlots to know they are taking the right steps to improve results. The reason is that grid reports are based on lots of 100, as shown in Table 2.

	Yield Grade (YG)					
Quality Grade	**1**	**2**	**3**	**4**	**5**	**Total**
Prime	0	1	5	3	0	9
Choice	6	23	26	1	0	56
Select	10	19	15	0	0	34
Standard	1	0	0	0	0	1
Total	17	43	36	4	0	100

Table 2. Grid Report by Lot

In this imaginary report, for this lot of 100 animals, a packer will pay a feedlot $74,760 – a base price of $75,000, plus $1,035 in premiums, less $1,275 in discounts (for simpler calculation, the example assumes a consistent carcass weight of 750 pounds and a base price of $100 per hundredweight).

While it does a feedlot no harm to know they produced 23 cattle at Choice/YG2 and 19 at Select/YG3, they really can't

act on this level of information. Reports by lot don't say much more than "Good try. Better luck next time."

Although modern packinghouses use high-end computer systems and business management software and produce volumes of information about every animal they slaughter, they have no viable, economical way to exchange information about individual animal quality and yield with their feedlot suppliers.

Reporting by animal

Pardalis's Beef Information Marketplace is designed to make better information readily available, easy to exchange, and ultimately profitable. Packers using the Marketplace will be able to generate and provide reports like the one represented below – with information about each animal – to any feedlot with access to the Web.

Animal ID	Source Premises ID	Quality/Yield Grid	Premium/ Discount	Price/cwt.
840106285532834	F398R64	Prime-2	9.00	109.00
840588943687974	F398R64	Choice-3	0.00	100.00
840662551388554	F398R64	Choice-3	3.00	103.00
840976250861936	F398R64	Choice-3	5.00	105.00
840286535429675	F398R64	Prime-4	-14.00	86.00
840094629173297	F398R64	Prime-3	6.00	106.00
840553283410628	F398R64	Select-3	-6.00	94.00
840285555328346	F398R64	Choice-4	-20.00	80.00
840820573954682	F398R64	Select-3	-6.00	94.00

The change might seem simple at first glance, but the implications are enormous. With a report keyed to individual animals and their unique IDs (mocked up here in standard NAIS format), a feedyard can determine exactly which animals performed well and which did not. They will know, for instance, exactly which 5 animals hit Prime/YG3 and exactly which grids the other 95 landed in.

Most important, as the "hot linked" animal ID numbers suggest, the Pardalis system will associate each animal's ID with a lifetime's worth of information.

Whether they use the Beef Information Marketplace as their database or import Marketplace data into another system, feedlots will be able to drill down into all the information they have generated about their handling of the cattle. They can readily correlate quality and yield with growth on feed, rapidly determine the success of specific feeding and health regimens, identify the stockers who supplied the best—or worst—performing animals, and much more. With this level of information, they will be better able to adjust their operations and improve performance on a broad scale.

Ten simple steps: capitalizing on information

One last grid report will demonstrate how valuable this quality information could be. It is based on the previous report by lot, but with 10 small yet significant improvements. This report makes the simple assumption that, with information about individual animals, the feedlot was able to improve 10 carcasses by a single step each – moving either one step up on the Quality scale or one step left on the Yield Grade scale. These ten simple steps equal one big revenue jump.

	Yield Grade (YG)					
Quality Grade	**1**	**2**	**3**	**4**	**5**	**Total**
Prime	1	2	7	3	0	13
Choice	6	24	25	0	0	15
Select	10	18	4	0	0	32
Standard	0	0	0	0	0	0
Total	17	44	36	3	0	100

Table 4. Grid Report with 10 Single-Step Improvements

All other numbers being the same – 750 pounds per carcass, a base price of $100 per hundredweight – the feedlot will receive $75,322.50 for these 100 animals – an increase of $565.50 for the lot. If the feedlot sells 2,000 lots annually, their revenue increase for the year would be $1.125 million.

The Beef Information Marketplace is designed as the first real, Web-based marketplace for information. It recognizes the reality that information has value measurable in hard dollars. In the Marketplace, beef producers will be able to sell, buy and trade information based on its value to their business. In this Information Marketplace, much like a livestock market, packer and feedlot will come to terms about the value of individual animal reports and agree on an appropriate exchange price.

The new information marketplace

By enabling the efficient, profitable exchange of industry information, the low-cost, centralized, Web-based Beef Information Marketplace will help producers improve their product and their ability to market that product, promote the production of higher quality beef, create new opportunities for partnership for producers up and down the supply chain, and contribute to the prosperity of the beef industry as a whole.

Equally important, the Pardalis system will protect the information ownership rights of everyone who participates in the Marketplace with patented new digital rights management technologies that effectively lock down information until the producer who created it grants permission for others to receive and use it.

In the coming months, look for more from Pardalis about information and profitability – and more about how the New Information Marketplace for the Beef Industry will benefit today's beef producer.