Lamb Value Based Pricing Report
Submitted by the Roadmap Implementation Team Sub-Committee
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The Sub-Committee on Value Based Pricing was given ten points to address. The following is the progress toward response to those ten points.

1.Value Based Pricing-Definition

Value based lamb pricing is price discovery that provides market signals to produce a specific type of lamb. Value can be determined within terms of cutability and consistency attributes that are quantifiable on an individual carcass (weight, fat cover, grade, muscling, etc.) and/or might include production practice requirements (ABF, grass-fed/finished, age requirements, traceability, etc) with opportunities to pass value through the system: from packer to feeder, to feeder lamb producer, to seedstock producer (Hiemke, 2014).

It is important to note that the market signals sent to the industry comes from both the end consumer and the customer of the packing plant which for the most part is not the consumer. The packer's customer is generally a retailer, food service distributor or chef and their expectations of the value proposition is primarily the physical characteristics of the carcass, the primal, or the cut such as yield, trim specification, expected size, etc. These specifications vary widely between each segment, intended use, and even ethnicity.

The end consumer generally sees a product that conforms physically to expectations (typically the producer, feeder, packer and/or packer's customer have modified and absorbed the irregularities) but it may or may not meet the consumer's eating experience expectations. Since the end consumer experience is generally filtered through the packer's customer, the packer typically is more focused on the physical characteristics for value pricing than on the consumer's eating experience. The question then is, how can the end customer's eating experience be more accurately transferred back along the chain?

There is also the opportunity to create an incentive to deliver a year-round supply. With the vast majority of lambs being born in a few months it is a precarious balance between delivering a year-round product to consumers against consistent quality when feeders and packers have to stretch out the natural production cycle. Value based models could reflect premiums based upon a producer's ability to deliver a quality product during the "off" season; however, the overall market consistently provides delivery date premiums and discounts.

2.Literature Review

The literature has numerous papers on value based pricing of beef cattle. Since many attributes of lamb are similar to those of beef it seems logical to review work that has been reported for beef.

Hogan, Anderson and Schroeder (2009) state that "grid prices, or value-based marketing, refers to pricing cattle on an individual animal basis." They go on to say, "that pricing fed cattle on averages is detrimental to the industry because it does not send appropriate price signals to cattle feeders, stockers and ultimately, cow-calf producers." Fed cattle are usually priced on live weight, dressed weight or carcass grade and yield or grid pricing.

"Selling fed cattle on a live basis is no longer standard practice, and some day it could end up as no more than historical reference." (Reiman, 2013) Cash sales (live basis) have declined from 52.1% in 2005 to 26% in 2012 and negotiated sales, like grid marketing have moved from less than half of sales to more than three-quarters in the same time period (Reiman, 2013).

Feuz (2001) states that "recently, there has been increased emphasis on improving the quality and consistency of beef. Cattle producers, breed associations, feed suppliers and packers have initiated value-based pricing methods commonly referred to as grid pricing. While these various schemes may differ substantially in the carcass traits they seek to reward or penalize, they all have one common feature: price is established on each individual animal based on carcass merit." Feuz goes on to say that the base price is more critical to receiving a higher net than grid premiums or discounts since it affects the whole sale lot. Base price is determined by previous week's cash price which can provide packers an incentive to lower cash bids. Base prices tied to the Chicago Mercantile Exchange Live Cattle Futures or to wholesale beef market prices can contribute to competition and price discovery.

Ward, Schroeder and Feuz (WF-561) suggest the producer needs to be aware that value-based pricing/grid can lead to lower overall prices if the quality of livestock is quite variable or poor. More of the risk is transferred to the producer. In live weight pricing packers bear the risk of actual carcass characteristics vs. estimates of their buyers. With dressed weight pricing, packers still bear the risk of some carcass characteristics like quality grade, yield grade and "out" carcasses while with grid pricing producers bear the risk for carcass characteristics. There is a risk and return tradeoff and whoever accepts the most risk has the opportunity for the greatest gain. "Only when genetic and management changes are made, which result from grid pricing information, can long-term value-based marketing be achieved."

Interestingly enough, Hamilton et al. (2010) report a trademarked LambGridCalc spreadsheet which can be used to send signals back through the chain from the consumer to the producer and can be even be used to calculate the value of selection of a superior ram at the producer level.
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3.Examples of VBP in the sheep industry from the producer's viewpoint

Niman Ranch

Cody Hiemke (2014) reports that 100% of Niman Ranch lambs are purchased on a weight and yield grade grid (Superior Farm Dixon's house yield grade not a USDA yield grade). The grid rewards lamb carcasses that fall within the specifications of the grid and discounts lambs outside of the desired parameters. The lower premiums for a Y3 compared to a Y2, and the discounts for Y4 and Y5 on a 63lb lamb is the $/lb hot carcass weight variation in value of the carcass due to added trimming. Accompanying 100% of the Niman lambs will be a kill sheet. 100% of Niman growers see the kill sheet and invoice for 100% of the Niman lambs on a weekly basis. Not provided on 100% of the lambs is loin depth, loin area and actual fat thickness (5.1%) since that data is very time consuming to collect.

Dennis Stiffler (2014) states that Mountain States Rosen purchases lambs from their growers on a grid system. Much like Niman, there are yield grade and weight parameters with incentives and disincentives built into the grid. Both programs increase and decrease the natural premium to drive seasonal supply. MSR, like Niman, awards for production systems (Natural and Traceability) in the grid. Adjustments for "out" lambs are built into the grid as well.

Superior's Pure program. "The Pure Lamb Program assures that no lambs have been treated with hormones or antibiotics, and the animals are carefully tracked from birth to provide accurate records of responsible husbandry. If animals fall ill, they are treated but removed from the program."
(http://superiorfarms.com/foodservice/our-products-2/) An incentive is offered the producers if they can provide evidence that their lambs meet these conditions. Superior also prices lambs on a double dressed weight basis which rewards those dressing over 50%, while it serves as a disincentive for those dressing below 50%. Dressing percent is based on muscling, fill, pelt weight and the amount of fat. This system works well if it is applied to the individual lamb that has been properly shrunk, has a desirable pelt, is muscular and yield graded to avoid excess fat. Superior relies on the overall market rather than traditional grids to provide incentives and disincentives for weight or yield grade with additional disincentives for extreme yield grades. As with other processors, Superior offers individual contracts with producers which have embedded incentives for certain value based specifications.

There has been some discussion about the challenge that seems to be approaching in that many of the grids and contracts use a base price indexed off the carcass market. The issue is that the carcass market is becoming very thin with fewer and fewer carcass trades occurring each year by fewer and fewer participants. This could have some important implications for grid purchases and the associated price discovery. Each packer will have to determine the most appropriate method of determining base price in the future and adjust to the data available to them and/or request additional information.

Fundamental to value based marketing concepts for the sheep industry is an understanding of the role USDA Lamb Grading plays as an indicator of both quality and cutability (percentage of saleable meat) attributes of the lamb carcass. Grades are predictive of expected eating experiences and physical characteristics and along with weight classifications have been key determinates of carcass value. Previous discussion in the literature review alluded to the importance establishing a functional base price that supports competition and price discovery by indexing it to a third party information source.

USDA Lamb Grades have been used in marketing and grade labeled programs to ensure credibility to the classification of carcasses, primals, subprimals and case-ready products of lamb since 1931. They have been amended numerous times over the years (1951, 1957, 1960, 1969, 1980, 1982 and, lastly, 1992) for various reasons.

Grading of lamb carcasses is voluntary and paid for by the Packer. It is managed by the USDA-Agricultural Marketing Service (AMS), thus providing third party oversight. Lamb offered for grading must simultaneously be graded for both quality grade and yield grade (cutability).

United States Standards for Grades of Lamb, yearling Mutton and Mutton Carcasses (July 6, 1992)
Grade Factors. Palatability-indicating (eating satisfaction) characteristics of the lean and conformation are referred to as Quality and an estimate of the percent closely trimmed semi-boneless and boneless major cut derived from the carcass is referred to as Yield.
Quality grade is divided into three separate section based on maturity indicators for lamb, yearling mutton and mutton. There are four grades within each class – Prime, Choice, Good, and Utility for lamb and yearling mutton; and, Choice, Good, Utility and Cull for mutton. Quality grades are determined by a subjectively evaluation of maturity (color of the lean, roundness and redness of the rib bones and the presence of "break joints" or "spool joints"), leg conformation score, flank fat streaking (somewhat like marbling) and the flank firmness.
There are five (5) yield grades applicable to all carcass classes, denoted by numbers 1 through 5, with Yield Grade 1 representing the highest degree of

cutabilility, and Yield Grade 5 representing a significantly lesser degree of cutability and ultimately lesser value to all sectors of the industry. Yield grades are determined by the amount of fat at the center of the ribeye/loineye between the 12th and 13th rib and then subjectively adjusted for the amount and distribution of fat over the body wall of the carcass and at key anatomical parts such as the sirloin- loin juncture, the should pocket, the cod/udder, flank and breast.

Not all lambs are graded; many of the non-traditional market lambs are not graded and many small harvesting operations can not justify the commitment required and the expense to have access to USDA grading. The larger packers, for the most part, have on premise USDA graders; however, they may opt not to grade every lamb, i.e., certain custom programs do not offer their lambs for grading. In addition, Packers have the option to specify what lambs they want to have the grade designated. It is most common for most Packers to only designate carcasses that qualify for Prime and Choice to be graded, which means they are Yield graded as well. Carcasses that do not qualify for Prime and Choice grades are not graded and commonly referred to as "no-roll or ungraded" lamb (4 to 7% of the young lamb consist). These carcasses will not receive a Yield grade designation either. In actuality, very few, if any, mutton carcasses are graded. In 2013, only 70% of the Federal Inspected Slaughter Lambs were graded (USDA-AMS 2013).

A large majority of the retail and foodservice industry do demand USDA Grade Labeled lamb programs. A few upscale boutique retail and foodservice programs differentiate themselves by offering Prime product to their customers and these programs are usually limited to the rack and loin products. However, compared to the beef sector, lamb grades play an insignificant role in the differentiation of products, programs and value. For the most part, this is because lamb does not have any significant tenderness issues. Yield grades are a much bigger differentiator for retail and foodservice; however, since the majority of lamb is sold as pre-fabricated primals, subprimals and case-ready retail product, the Packer absorbs the yield differential between Yield grades.

USDA grade standards are functional in classifying an existing heterogeneous population into groups that exhibit more homogeneous "value" characteristics. USDA grades for lamb carcasses are "visually" applied to whole carcasses that are not ribbed, due to this "subjectivity", lamb grades have come under general criticism and have been considered inconsistently applied, particularly Yield Grades. Many of the previously mentioned amendments of the USDA Grade Standards have been charged with debate regarding the implementation and optimizing the usefulness and application of the service. Arguably, USDA grades for lamb carcasses have not been effectively used by the industry to differentiate value of either the live animal or the lamb product. Weight has been the driver, not carcass merit. For value based marketing to achieve results and become a marketing tool, the industry must focus on those characteristics and attributes

that ensure consistent eating satisfaction and adapt more accurate and precise tools to determine the composition of the weight and the yield of edible meat.

Mutual agreement can be reached by the majority of the industry sectors that some sorting or classification is necessary to differentiate value. Accurate application of the USDA grade standards can facilitate this.

A functional tool that has been adopted by the pork and beef industries is instrument grading. The pork industry, although not overseen by USDA-AMS, has used instruments to predict percent lean in pork carcass for a very long time. Several years ago the beef industry introduced, under the oversight of USDA-AMS, video image analysis instrumentation, i.e., Instrument Grading to improve channel specific marketing, product differentiation and establish value attributes that can reward producers and capture improved margins.

Research on video imaging of carcass lambs suggests that the technology can "objectively" predict carcass composition and classify carcasses with similar qualitative attributes. In March of 2014 Colorado State University released a report titled the "Industry Implication and Economics of the Lamb Instrument Grading" funded by both the American Lamb Board (ALB) and the National Sheep Industry Improvement Center (NSIIC). The key findings identified that Instrument Grading would not eliminate the need to have USDA-AMS oversight and the associated cost. However, it would improve the ability to more accurately sort carcasses into weight and cutability groups that would allow the Packer to ensure a greater degree of product consistency, improve cooler management, as well as increase fabrication throughput efficiencies and cutting style selection that optimum carcass returns. In addition, the study suggested that valued data feedback through the supply chain should communicate market signals and reward producers for marketing high quality and high cutability lambs.

USDA-AMS is in the final stages of standardizing and certifying a video imaging system that the lamb industry can and should adopt. The implementation of instrument grading technology can augment and improve upon the current grading system.

4.Characteristics of lamb that have value to the consumer

The Roadmap project has identified price, quality and consistency as the primary deterrents to consumer preference for American Lamb. Stiffler (2014) suggests "we have a fat problem." He goes on to say' "we do not have a quality (tenderness) problem, we do not have a muscle to bone ratio problem, and, in my humble opinion, we do not have an age problem (the consist of age driven no rolls are less than 5% of the fed lambs). I do accept the fact that there are flavor

notes or flavor profile differences (somewhat driven by age), but I submit that this attribute is more unique to consumer preferences, rather than it is deleterious."

Rick Stott (2014) suggests that lamb products have mild flavor, strong flavor or "bad or gamey" taste and that the first two appeal to different consumer groups, but the third is objectionable to all consumers. This has a significant effect on the consumer's eating experience but it generally has little obvious correlation with the physical characteristics of the established value based grids.   It is unclear where along the chain from producer to the consumer's table "bad" taste develops. In Australia pH and temperature decline of the products are monitored to avoid taste changes as the product moves through the processing chain. http://www.premier1supplies.com/sheep-guide/wp-content/uploads/2013/09/Achieving-target-pH.pdf. There is little or no evidence that this type of monitoring is done in the US.

Lamb fat has a very unique aroma and flavor. The literature indicates that breed (fineness of wool), age, sex, feed (grass vs legume vs grain), and ambient temperature during the finishing period all contribute to differences in lamb flavor. Ducket (2013) states that "several compounds (branched chained fatty acids, carbonyl compounds, sulfur containing compounds, lipid oxidation products, phenols and basic compounds" affect the flavor of lamb. Monitoring and controlling these compounds during processing is difficult, but, if accomplished, could lead to a more stable product with less "bad" taste being produced. More research in this area is suggested. If chain speed tests can be developed then these results could conceivably be included in value based pricing grids.

We can look at the beef industry for evidence of consumer driven standards for beef quality. In a recent post by Larry Corah, Vice President, Certified Angus Beef LLC in Perishable News (2014) it was stated, "Consumer taste sets target for beef." "In 2014, the share of cattle grading Choice is averaging nearly 67%, compared to the mid- to low-50% area just a few years ago. Percent Prime is averaging over 4%. Angus-type cattle qualifying for the Certified Angus Beef ® (CAB®) brand are up from 24-25% a year ago to a range of 26-29% for early 2014.

What you might not know is how important quality grade is to consumer satisfaction. Dr. Dale Woerner, Colorado State University meat scientist, noted at a recent industry seminar that flavor has replaced tenderness as the key driver of beef consumption. He added that marbling is the critical component in beef flavor, so as quality grade increases, consumer satisfaction increases.

That's based on research funded by the Beef Check-off, he said, where a panel trained to detect differences in beef flavor evaluated middle meats from carcasses of varying quality grade. The results were enlightening. As shown in the figure below, Select grading product was less than 30% desirable while Prime was in the upper-90% range. Since flavor is our beef consumption and demand driver, the target is very clear."

The beef industry has extended its value based models beyond the physical characteristic of the product (yield, size, breed, etc.) and have provided value model based upon the eating experience of the consumer via the grading of the marbling i.e. flavor profile. In fact many of the packers have refined the grading beyond the standard broad USDA grade categories by bifurcating each grade. For example, CAB uses the upper 2/3 choice, Double R Ranch uses upper 1/3 choice, Snake River Farms segregates prime carcasses into three tiers, and Laura's Lean segregates select. Each program targets a specific eating experience and charges a premium for the consistency of meeting the consumer's expectation. Are these same flavor profile indicators present in lamb and can they be measured?

5. Determine the audience for the report from this subcommittee

The target of this report should be the entirety of the production chain from seedstock through to the packer. The packer receives signals from the packer's customer and the consumer indirectly and then passes them back to the feeder or producer. The packer especially has an opportunity to send signals about fat and waste back down the line because the production system (typically the feeder, packer or packer's customer) is absorbing the costs of poor meat yields. The producer gets signals from the feeder or packer and passes them back to the seedstock level. It is critical that each segment of the industry understands the concept of value based pricing and the pro's and con's of the system. It is a price discovery mechanism where both the buyer and seller are more equally informed and that the value is based on the individual livestock and not on an average. The producers are amazingly creative in producing the desired product if they are informed of the specifications, educated about them and rewarded for quality.

6. Coordinate the efforts of this subcommittee with the Product Characteristics and Productivity Committees.
The driver for adoption of VBP is the long term gain to all segments of the value chain by sending true market value signals. A lot of effort is being expended by

the Demand Creation Team on identifying the characteristics of lamb products that have value to the consumer.

We know there are genetic tools and production efficiencies that can improve lambs' value proposition to the consumer. The Productivity Team is charged with identifying and advancing those criteria. The Product Characteristics team is focusing on certain characteristics that differentiate the value proposition of lambs i.e., flavor, fatness and size. In addition, the Lamb Quality Audit will provide a foundation to establish certain industry priorities that can be communicated throughout the value chain. The Implementation Team sub-committee on VBP will follow the finding of those committees and provide supporting and contradicting views.

The Tatum literature review identifies the critical chemical components of lamb that affect flavor and the factors that alter these chemical components. To date it has been difficult to develop rapid, inexpensive tests that can be conducted in a production or processing environment to quantify the chemical components that influence flavor in lamb.

Initially, it is important to address the problem in our industry of recurring fat issues. This is where value based grid pricing can and should be most effective. This can relate directly to the consumer by encouraging 1) a leaner product and 2) a product with less waste and therefore less cost. There is significant cutability loss between each yield grade. If the packer puts values to those losses and pay prices are adjusted appropriately from the base price for the cutability loss, especially on Y4 and Y5 lambs, we could at least see an appropriate value of sellable, trimmed lamb as an incoming cost.

Another charge of the Implementation Committee is to investigate the adoption of electronic grading. In plants that implement electronic grading will this become the basis for VBP, especially if the incentives and disincentives are passed back to the supplier of the lambs?

VBP is popular with sellers of lambs when the quality meets the grid specs and when the lambs can be processed precisely when they are ready. There is a delicate balance between appropriate demand and supply which must be met to maintain orderly movement of lambs through the system when they are most desirable.

7. Produce a report to be shared with all segments of the industry and consumer audiences involved.

This sub-committee will identify the critical points and then engage ALB/ASI and technical experts to determine how best to disseminate the information be it through a report, webinars or other means.

8. Develop a method of measuring progress in the adoption of value based pricing within the industry.

This is difficult due to P&S since they discourage packer reporting of publicly available information such as Colorado feeding inventories. It is difficult to define where the line is drawn between value based pricing and forward contracting under a grid. Perhaps a third party organization like ALB/ASI can survey the industry and benchmark where we are at present and subsequently follow up to determine how market conditions change over time. It seems that there is still confusion about what can and cannot be done for reporting. To establish a benchmark, the question is asked, "can a segment be added to the LM352 formula price that reports the percentage of lambs purchased via a formula that adjust for individual carcass cutability by some measure of fat and/or muscling?"

9. Determine the best way to promote further use of value based pricing within the industry.

This will be consumer driven. When a product can be delivered to the consumer that has certain characteristics, either positive or guarantee of the absence of negative qualities, and the consumer is willing to pay a premium, that differentiated price will be shared among the supply chain based on all the parties that creates the value or has the ability to manage the quality. When it starts with the consumer the value based pricing models will reinforce the production behavior. Because of a wide array of climate, feed, production models, etc. in this country there is a wide array of lamb types produced. Fortunately, not all of our consumer groups have the same expectations. The market has demand for many different characteristics. Small lean lambs for Muslim trade; large marbled lamb for foodservice; or, consistent size/yield lamb for retail. Size becomes a problem when the mix does not align with the inherent demand. Because of this, one grid does not fit all and buyers will develop value based pricing to suit their needs.

10. Set reasonable goals for adoption in year 1, 2, 3, etc.
Before goals can be established, benchmarks need to be established. Before we can set goals or determine how much the needle can be moved we need to have a solid understanding and an accurate accounting of where we are today. The goal is to move from selling on the average to selling on the true value of the individual. That will move the needle and eliminate the outliers and non-conforming individuals.

In the 2013 CSU Draft Report on Instrument Grading it was reported that a 2007 study that surveyed 302 lamb producers quantified the percentage of lambs sold through various valuation methods at slaughter. Lambs were marketed by per head (23.9%), live weight (74.7%), carcass weight, not dependent on grid value (14.3%), and carcass weight, dependent on grid value (7.5%). However, large operations with annual revenue greater than $200,000 tended to merchandise

lambs by grid value and carcass weight with 53.3% of responding operations. (Viator et al., 2007). In order for USDA lamb grading to reach benefits of rewarding lambs of superior quality and cutability (and discounting lower quality and cutability), lambs should be valued on the relationship of weight and assigned grade. With respect to price scheduling and value, current lamb cut prices are known and a processor can calculate a live price with knowledge of predicted yield and specified profit margin a relative price for live lambs at the processing plant (Hopkins, 1989).

The sub-committee is currently trying to determine if the USDA has a definition of value based pricing, so an accurate benchmark can be established to measure future progress from.

The American Sheep Industry must be committed to rewarding producers for lambs and lamb carcasses of high quality and yield that fit the demand of the market channels which provides both sales and growth opportunities. Value Based Pricing or use of Grid Pricing has potential to provide the lamb industry with increased market value and pricing stability. The adoption of a tool like instrument grading will advance the ability of Grid Pricing to further identify those carcasses that meet consumer's expectations; and, thus reward producers and livestock management system that deliver carcasses that fit specific channel marketing opportunities. Data capture and shared information among the producer segments related to specific targets and nonconformity will be important to advance value base pricing throughout the marketplace.

For the supply of lambs to grow good producers need to be consistently profitable in a stable market. They must have the incentive and confidence to invest into their production. The consumer has proven to be willing to pay a higher price for products, whether it's lamb, beef or any other good, when that product is consistent and is of high quality. This stronger demand will encourage growing the supply and will provide financial stability to the producers and the industry as a whole. Consumers expect a year-round availability, therefore, seasonality factors must be considered and not result in more varied product ensuring a year around supply of consistently high quality products.

The lamb industry must change its course and it will require restructuring the marketing system. Weight, in and of its self, cannot continue to be the dominant market value driver. Value Base Marketing will afford the industry to grow and prosper by rewarding the individual quality attributes of the lamb carcass and its parts and provide a higher quality consistent product to the consumer.

This committee is united in stressing the importance of increasing Value Based and Grid Pricing and encourages: 1) the feedback of data through the entire production chain, 2) all packers to strive to increase their grid-based pricing to over 80%, 3) Feeders and producers use the best data available to produce the

highest quality lamb, and 4) Commercial and Seedstock producers to respond to these lamb quality indicators.

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