Wholesale Pork Price Reporting Analysis

Commissioned by the

Agricultural Marketing Service, United States Department of Agriculture

November 2009

A Value Ag, LLC Report

Value Ag, LLC.
Columbia, MO
www.valueag.com

Acknowledgements

We gratefully acknowledge pork industry stakeholders providing observations, perceptions, concerns, and practices relative to wholesale pork trade. Their valuable input led to the reported findings presented here. Pork industry stakeholders providing input included producers, state and national producer associations, hog processors, hog processor associations, pork buyers, distributors, regional buying cooperatives, retailers, and retailer associations. We also acknowledge valuable contributions of external reviewers, Dr. Ron Plain and Dr. Randy Fortenberry. Reviewers provided helpful feedback on a very short timeline. Last, we extend our appreciation to Agricultural Marketing Service staff in the Washington DC and the Des Moines offices for providing background information and historical data.

This project report represents the sole professional opinions of the researchers based on industry feedback, secondary data analysis, and a review of scholarly research in the area of price reporting. Agricultural Marketing Service staff provided technical related information upon request. Opinions presented in this report are solely those of the authors and do not reflect or represent views or opinions of Agricultural Marketing Service or U.S. Department of Agriculture.

The request for proposals and identification of investigators for this research project were coordinated by the Livestock Marketing Information Center (LMIC). We acknowledge Jim Robb, LMIC, for his efforts in organizing the project and the research team.

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Ted C. Schroeder, PhD, is a University Distinguished Professor of Agricultural Economics at Kansas State University. He has a B.S. from University of Nebraska and Ph.D. from Iowa State University. He has been on the faculty in Agricultural Economics at Kansas State University since 1986 teaching and conducting research. He is director of the North American Institute for Beef Economic Research (NAIBER.org). Ted has done extensive research in livestock market risk management, beef demand, cattle and beef marketing, and price discovery with more than 90 published journal articles and numerous other publications. Schroeder has worked as a consultant on numerous beef and cattle value added projects and he has also been the principal investigator on a large number of external grants.

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EXECUTIVE SUMMARY

The United States Department of Agriculture (USDA), Agricultural Marketing Service (AMS) reports prices for wholesale pork trade using information provided to them by hog processors and/or pork buyers. Wholesale pork price reporting by packers is voluntary unlike swine, cattle, boxed beef, lamb, boxed lamb imports, and boxed lamb markets where price reporting for qualifying packers is mandatory under the authority of the Livestock Mandatory Reporting Act of 1999. Concerns have surrounded AMS reporting of wholesale pork prices for a long time, and over the past ten years minor adjustments in voluntary price reporting guidelines have occurred. In the mean time, several concerns regarding pork price reporting have become more problematic. One of the strategies being considered to enhance pork price reporting is to make pork price reporting mandatory for qualifying swine packers. The purpose of this study was to determine advantages, drawbacks, and potential implementation issues associated with adopting mandatory wholesale pork price reporting.

Public price reporting provides important information that facilitates trade and enhances market efficiency. Effective price reporting helps individual transaction prices converge more quickly to a market-clearing price. Faster convergence reduces pricing errors which are costly to market participants and thus to society as a whole. Publicly reported prices are used as a base in formula priced trade, which amplifies the importance of accurate price reporting. Price reporting reduces asymmetric information among market participants, which helps to level the playing field and counter-balance possible market power. Price information signals resource allocation, production, processing, and marketing decisions. Price data from different market levels such as farm, wholesale, and retail are used to calculate marketing margins, which reveal changes in marketing costs among vertical industry sectors. The broad private and public importance of price information makes reliable, accessible, timely, and accurate price reporting a valuable activity worthy of public investment.

Scope of project:

- Identifying problems with current pork price reporting.
- Determining how changes in pork processing and trade are affecting pork price reporting.
- Assessing to what extent mandatory price reporting would reduce pork price reporting problems.
- Identifying potential benefits and costs of moving to a mandated pork price reporting system.

To accomplish the goals, we completed a number of tasks that included:

- Information gathering through phone interviews, in-person discussions, and surveys with swine producer associations, swine packers, pork processors, retailers, food service firms, and organizations representing several facets of the hog and pork industries.
- A review of relevant literature regarding price reporting and its value.

- Analysis of historical trends in hog and pork pricing practices, trade, cold storage, pork prices, exports, and related industry developments.
- Summarizing pork price reporting volume and frequency of missing or unreportable price quotes from analysis of historical AMS daily and weekly price reports.

Results:

Wholesale pork price reporting is thin and suffers from frequent missing or unreportable price quotes for subprimals and the frequency has worsened over time. Missing or unreportable price quotes are mostly associated with changes over time in the way pork is traded. Causation of reduced reporting frequency lies largely with industry practices that are inconsistent with current USDA guidelines defining reportable trades. In particular, more pork is being:

- traded in forms that are either not reported or not reportable (e.g., enhanced product, case ready product, branded product, or frozen product),
- transacted through intra-firm transfer, through inter-firm transfer, through formula pricing, through forward price contracts well in advance of delivery (beyond 7 or 10 days forward as used by AMS), and
- destined for export markets which are excluded from AMS pork price reports for the negotiated cash guidelines used by USDA.

Pork price reporting thinness is resulting in less trust in reported prices by industry participants, raising concerns about potential selective price reporting, and generally causing reduced public value of published price reports.

Overall, moving to mandatory price reporting has some support at every segment of the industry we interviewed (producers, packers, processors, retailers, and food service). However, that support is certainly not unanimous among all industry participants in every industry segment. Mandatory price reporting would offer potential societal benefits to producers and consumers. However, benefits of adopting mandatory pork price reporting would likely be modest and smaller than some industry participants might anticipate. However, regardless of the decision to adopt mandatory reporting, several other considerations are worth considering in enhancing overall effectiveness and value of wholesale pork price reporting.

Implications:

- Mandatory wholesale pork price reporting would likely reduce the number of missing daily pork subprimal product price quotes, unless confidentiality clauses became problematic precluding publication of specific prices.
- The seriousness of the limitations caused by confidentiality clauses in pork price reporting would in part depend upon the aggregation scheme AMS designed versus trying to report price for more differentiated products. As the number of pork subprimal

product specifications that are reported increases, the more likely the confidentiality clause would be binding.

- Mandatory wholesale pork price reporting would reduce concerns about potential selective price reporting.
- Mandatory wholesale pork price reporting would encourage more industry participants to use weighted-average prices in formula trade instead of market top prices, as is current practice with a majority of pork trade.
- Mandatory wholesale pork price reporting would increase price information to small market participants more than it would to large volume market participants. However, large firms tend to have a comparative advantage in data analysis making them more able to analyze and utilize additional published data that might come with mandated price reporting.
- Mandatory wholesale pork price reporting alone would not address many of the concerns of industry. In particular, industry largely would like to see a price reporting system designed and implemented to effectively:
  - capture increasing product heterogeneity that requires development of more category items to report by AMS or development of appropriate ways to convert prices of differentiated products back into forms that can be combined with a reported product form,
  - capture various enhanced products,
  - capture case ready product because of branding and product heterogeneity,
  - include export sales to Canada and Mexico,
  - deliver separate reports for formula and forward pricing methods, and
  - capture pork belly transactions that better reflect what industry actually trades.
- If wholesale pork price reporting is made mandatory, the price reporting legislation should provide AMS with the flexibility necessary to modify price reports as the industry evolves. For example, AMS needs to be able to modify price reporting to accommodate evolving technologies for enhancing product, new industry processing practices, and changes in product segmentation and labeling. Without additional flexibility, important price reporting modifications over time are too cumbersome, slow to occur, and costly.
- Reporting wholesale pork prices for differentiated products should be explored further by AMS because such products are likely to continue to grow in importance. As these products grow in popularity, they remove product from reportable trade under current AMS reporting guidelines. We recommend assessing use of hedonic modeling techniques to convert heterogeneous wholesale pork subprimal product prices into comparable prices for more broadly defined products that can be reported in summary fashion.
- Additional enhancements to consider for broader implementation include incorporating prices of pork being exported to Mexico and Canada and product to be delivered within three weeks instead of just ten days or two weeks in wholesale pork price reporting.

CHAPTER 1: INTRODUCTION AND PROCEDURES

1.1 INTRODUCTION

The United States Department of Agriculture (USDA) Agricultural Marketing Service (AMS) is responsible for public price reporting in the wholesale pork market. Wholesale pork price reporting is completed by AMS market reporters who compile market news reports based on information collected via daily phone surveys of hog processors and pork buyers. Participation by pork sellers and buyers in AMS reporting efforts is currently voluntary. Because of the voluntary nature of price collection, together with changing pork market pricing, trading practices and product forms over time, the value of current price reporting is being questioned and changes appear worth considering.

Lack of adequate and reliable public price information in wholesale pork markets has been a substantial concern for industry participants for a long time. In 1996, Sparks Companies Inc. completed a report for the American Meat Institute assessing needs for pork price reporting improvements (Sparks, 1996). Conclusions of the Sparks study included that deficiencies were present in pork price reporting, much of which were related to prominence of formula pricing and inter-company transfers. They further determined that a lot of negotiated trade was not being reported to USDA for a variety of reasons. The report concluded, "The challenge to the pork industry would seem to be one of making sure that a viable price discovery and reporting system is maintained for, if it isn't, one could certainly visualize political interference and possibly a mandatory price reporting system in the not-too-distant future" (p. 63).

Not much has changed in wholesale pork price reporting since the 1996 Sparks report. Multiple wholesale pork products frequently do not have a reported daily price quote available, and when price quotes are released, there is a perilously low percentage volume of trade being represented in public price reports. Selective reporting of trade by packers is a concern that is often voiced. Changing pork product specifications and differentiated products that do not match products reported in public market news, together with more enhanced products, growing case-ready production, and export destined products that are excluded from wholesale price quotes, are resulting in thinner public price reports. These concerns, along with packer-to-packer pork sales that are not included in price reports and a shift over time away from negotiated cash commodity trade to formula pricing, have raised concerns about the usefulness of current publicly reported wholesale pork market news.

Concerns about public wholesale pork market price reports have lead to less trust and use by market participants, which raises the cost of collecting market intelligence for firms engaged in wholesale pork markets. Furthermore, lack of public price reports leads to asymmetric price information among market participants and potential for greater vertical and horizontal market power imbalances among firms engaged in the market. Consequences can include ultimately lower prices for hog producers and/or higher prices for pork consumers as a result of higher costs, greater uncertainty, and potential leverage of market power by wholesale pork market participants. As a result of these concerns, some industry participants and observers have suggested that moving to a mandatory wholesale pork price reporting system might reduce problems associated with current voluntary reporting. However, many of the

challenges with price reporting are not likely to be resolved by solely mandating pork price reporting. That is, changes other than simply mandating price reporting are necessary to address many evolving industry concerns regarding pork market information.

1.2 OBJECTIVES

The purpose of this research report is to determine the economic tradeoffs of moving from the current voluntary pork price reporting to a mandatory price reporting system. We also identify issues associated with pork trade that are important considerations for enhancing the value of AMS market news, regardless of whether pork price reporting is voluntary or mandatory.

Mandatory pork price reporting potentially has both advantages and disadvantages. Advantages include providing a systematic and objective means of collecting terms of trade for every qualifying transaction from processors required to comply with reporting requirements. Having a complete set of transaction data from a substantial segment of industry trade might enable USDA to provide price reports based upon a summary of confirmed transactions. However, formal reporting by USDA of terms of trade may raise other concerns. For example, USDA follows strict confidentiality guidelines when reporting wholesale beef prices, which are under a mandatory reporting system, so that reported prices and volumes do not disclose individual company transaction information (the "3/70/20" rule).[1] Given the structure of the pork packing industry, evolving product differentiation and possible thinness of trade in daily-negotiated prices, application of confidentiality rules to mandatory wholesale price reporting could actually result in fewer wholesale pork price quotes being published than under the current voluntary reporting system. That is, the confidentiality rule could result in USDA not being able to report prices for many pork products for multiple consecutive reporting periods that they otherwise do report under voluntary reporting. Whether this would occur or not can only be determined through examination of a data sample of what mandatory pork price data would comprise.

Other disadvantages of mandated reporting include costs of compliance by pork packers who would be required to routinely report daily wholesale pork trade to USDA. Furthermore, many of the challenges associated with wholesale pork price reporting have little to do with whether information is collected via voluntary or mandatory methods. That is, factors such as changing pork product forms over time, increased product differentiation and branding, more case ready product being produced that does not trade on a wholesale commodity basis, more export market trade, and increased reliance on forward and formula pricing are all substantial issues that simply moving from voluntary to mandatory price collection and reporting will not resolve without development and refinement of price reporting procedures. Particular objectives of this project include:

[1] The 3/70/20 confidentiality rule followed by USDA for mandatory price reporting is: "The guideline consists of three requirements: (1) At least three reporting entities need to provide data at least 50 percent of the time over the most recent 60-day time period, (2) no single reporting entity may provide more than 70 percent of the data for a report over the most recent 60-day time period, and (3) no single reporting entity may be the sole reporting entity for an individual report more than 20 percent of the time over the most recent 60-day time period." Federal Register, May 16, 2008 (p. 28,618)

1. Document procedures employed by AMS to collect, analyze, and report wholesale pork prices under voluntary price reporting with emphasis on identifying data and information that are collected and reported versus data and information that are not collected and/or reported.
2. Identify industry concerns with current voluntary price reporting procedures and reliability of reported prices.
3. Discuss the extent to which confidentiality rules in AMS price reporting under a mandatory system would affect the ability of AMS to report prices for all wholesale pork primal products on a daily basis.
4. Identify pervasiveness (and quantify) various terms of trade in wholesale pork product markets including: i) how far in advance prices and other contract terms are typically established relative to product flow, ii) methods used to discover prices (such as negotiated, formula pricing, etc.), iii) uniqueness of transactions that would make it difficult to summarize prices and volumes for individual primal cuts.
5. Assess current sentiment within the pork industry, including packing/processing firms, regarding the impacts of switching to mandatory price reporting.
6. Summarize strengths and weaknesses associated with switching from current voluntary to mandatory wholesale pork price reporting.
7. Determine additional research required to assess comprehensive costs and benefits of switching to mandatory wholesale pork price reporting.

1.3 PROCEDURES

A core activity of this project was to gather feedback from pork industry stakeholders who participate in wholesale pork markets and/or who consider wholesale pork price reports an important source of information. Accordingly, our research team interviewed pork processors, pork buyers, hog producer associations, and other key market participants to determine how they use AMS wholesale pork market news, identify problems with the current system, and learn what improvements they recommend. Members of the research team have recently used similar information collection procedures to examine benefits and costs of the National Animal Identification System, estimate costs associated with new beef packer regulations following BSE discovery in the U.S., and examine impediments to fed cattle price discovery and value based pricing (NAIS Benefit-Cost Research Team, 2009; Coffey et al., 2005; Schroeder et al., 1998). This is an invaluable part of determining where commonalities and disparities of industry stakeholders' opinions are with respect to their perceptions and market information needs. Moreover, this type of information gathering is imperative to gaining insights on complex and dynamic issues, such as wholesale pork price reporting, that influence an industry characterized by operations varying notably in size and business activities.

To gather industry information, both personal and electronic venues were used. In particular, a sequence of phone conference call interviews, face-to-face discussions, and on-line and written surveys were used. These sources of information collectively provided project investigators with a comprehensive set of insights and suggestions. This comprehensive information collection process was designed to ensure that entities of all varying sizes and

business structures in the hog-pork industry had ample opportunity to provide feedback and influence this study. The range of entities invited to provide feedback is demonstrated by the lengthy list of contacted parties summarized in Exhibit 1.3.1. In addition to the parties listed in Exhibit 1.3.1, we met with USDA AMS staff to gather insights on a) the political environment behind current and possible future wholesale pork price reporting systems administered by USDA AMS, b) details on current and past market news procedures, c) an overview of current problems and practical solutions that are available, and d) relevant experiences for wholesale pork price reporting from the beef sector and its conversion to mandatory price reporting. We also collected and analyzed historical wholesale pork price reporting data from AMS to determine thinness of price reporting.

We conducted numerous phone interviews and had several in-person meetings with industry leaders and firm representatives from supply chain segments including hog processors, pork processors, pork retailers, pork food service, and producer associations. We also conducted in-person meetings at the Packer Processor Industry Council (PPIC) and Retail Advisory Committee (RAC) meetings coordinated by the National Pork Producers Council and the Pork Board. We also spent time at USDA AMS offices in both Washington DC and Des Moines gathering detailed information about how pork price reporting is accomplished and assessing how mandatory price reporting would change current practices and associated market information.

In addition to phone conversations and in-person discussions, we sent a survey to a large portion of the hog-pork industry encouraging them to further provide industry sentiments and suggestions. In particular, we sent surveys to each state pork producer association, hog packers (including both barrow and gilt packers and sow and boar packers), and pork buyers, listed in Exhibit 1.3.1, to further ensure we gathered insights from parties throughout the industry.[2] As shown in Exhibit 1.3.1, the entities contacted range widely in size and scope. It was our intention to separately incorporate results from these surveys, differentiated between responses from pork producer, hog packer, and pork retailer respondents in our project report. Unfortunately, low survey response rates generally precluded us having sufficient confidence that responses were representative. In particular, we received partially complete surveys from only three pork producer associations, four hog packers, and 11 pork retailers.[3] Accordingly, to protect the anonymity of respondents we do not include any summary tables or figures from the pork producer association or hog packer survey response data. However, we do include survey results from pork retailers (discussed in Chapters 3-5).

[2] The complete survey documents are included in Appendix A.

[3] Confidential feedback was invited from anonymous stakeholders beyond those listed in Exhibit 1.3.1. As shown in the discussion of industry structure, consolidation has reduced the number of firms operating at every level of the pork value chain. Information reported in this study reflects the sentiment of firms representing approximately 80% of U.S. barrow and gilt processing, 60% of the wholesale pork procurement and merchandising, and approximately 50% of combined retail, foodservice, and cooperative buyer association pork volume.

Exhibit 1.3.1 Summary Sample of Industry Stakeholders Contacted to Provide Feedback.

Producer Associations	Oklahoma	Swaggerty Sausage Co	Premium Iowa Pork	Raley's
Alabama	Oregon	USA Pork Products	Seaboard Farms	Remke Markets
Arizona	Pennsylvania	Wampler's Sausage	Sioux-Preme Packing	Sam's Club
Arkansas	South Carolina	Williams Sausage Company	Smithfield	Schnuck Markets, Inc.
California	South Dakota		Southern Quality Meats	Supervalu Inc.
Colorado	Tennessee		Spectrum Meats	Sysco
Connecticut	Texas	**Barrow & Gilt Processors**	Swift	Target
Delaware	Utah	Carleton Packing Company	The Pork Company	The Great A & P Tea Company
Florida	Virginia	Cloverdale Foods	Triumph Foods	Topco
Georgia	Washington	Dakota Pork, Inc	Tyson Foods (IBP)	Wal-Mart Stores, Inc.
Hawaii	West Virginia	Dayton Meat Co.	VanDeRose Farms	Wegman's
Idaho	Wisconsin	Dealaman Eterprises, Inc.	Verschoor Meats	Whole Foods Market
Illinois	Wyoming	Dekalb Packing Company	Vin-Lee-Rom	Winn Dixie Stores, Inc.
Indiana		Cargill Meat Solutions	Weltin Meat Packing	Yerecic Label
Iowa		Fisher Ham and Meat	Yosemite Meats	
Kansas	**Sow & Boar Processors**	Greenwood Packing		
Kentucky	Abbyland Foods	Hatfield Quality Meats		**Industry Representatives**
Louisiana	Avco	Heritage Acres Foods	**Pork Buyers**	Agricultural Marketing Service
Maine	Bob Evans Farms	Hormel	Amazing Taste Foods, Inc.	American Meat Institute
Maryland	Calihan Packing Company	Independent Meats	BJ's Wholesale Club	Food Marketing Institute
Michigan	Dean Sausage	Indiana Packing Co.	Bozzuto's Inc.	Glenn Grimes, University of Missouri
Minnesota	F.B. Purnell Sausage	J.H Routh	Burgers' Smokehouse	National Association of Meat Processors
Mississippi	Gunnoe Sausage	Jim's Farm Meats	Darden Restraunts	National Pork Producers Council
Missouri	J.C. Potter Sausage	Kapowsin Meats, Inc.	Delhaize	Rob Murphy, Informa Economics
Montana	Jimmy Dean (Sara Lee)	Leidy's	Food Lion, LLC	Steve Meyer, Paragon Economics
Nebraska	Odom's Sausage	Martin's Pork Products	Giant Eagle, Inc.	
Nevada	Oldham's Sausage	Masami Meat Company	HEB Grocery Company	
New Hampshire	Owens Sausage	Morris Meat Packing	Kroger	
New York	Pine Ridge Farms	Olson Meat Company	Meijer	
North Carolina	Pioneer Packing Company	Parks Family Meats	Nash Finch Company	
North Dakota	Pork King Packing	Peoria Packing	Penn Traffic	
Ohio	Southern Pride Meats	Pork King Packing	Publix Super Markets Inc.	

CHAPTER 2: HOG-PORK INDUSTRY BACKGROUND

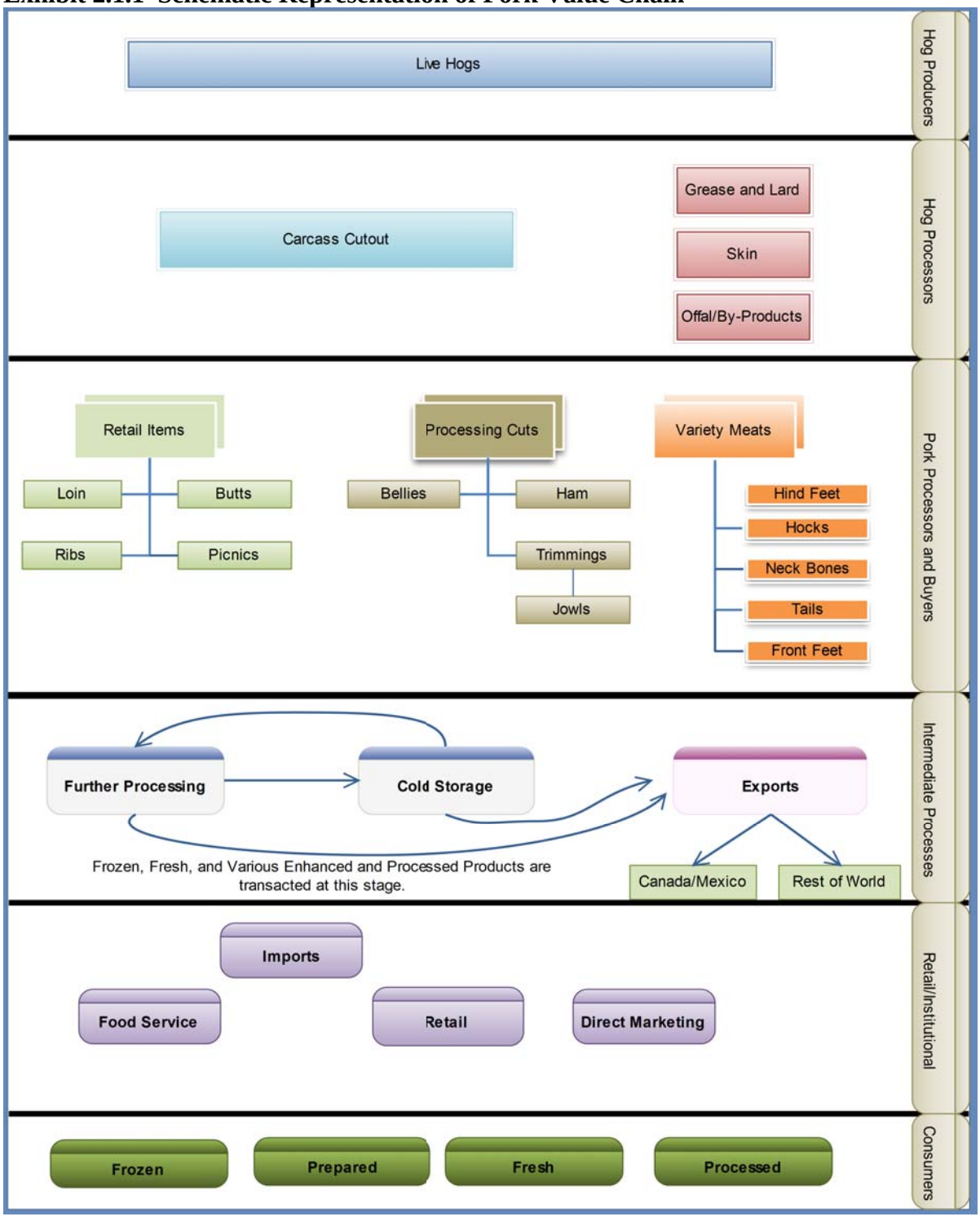
The hog and pork industry has experienced rapid and dramatic changes in industrialization, market development, and pricing systems. These changes are important to document in a study of wholesale pork price reporting because they directly impact the role and value of wholesale pork prices and price reporting in coordinating pork production and marketing. For example, both hog producers and pork merchandisers have increasingly adopted formula pricing methods for establishing output sales values. Formula pricing removes animals or products from cash negotiated trade, making reporting of cash prices in these markets more difficult as formula pricing becomes more prominent. Furthermore, the base used in formula pricing is often a publicly reported negotiated cash price. So, at the same time the amount of cash negotiated trade is declining, the importance of available and representative cash price information is increasing. This chapter provides a brief overview of structural changes occurring in the hog and pork industry that are important to understand as we evaluate wholesale pork price reporting needs.

2.1 VALUE CHAIN OVERVIEW

The pork value chain is comprised of hog producers, hog processors, pork processors, retailers, food service, and import and export markets (Exhibit 2.1.1). Often times, firms are engaged in several vertical dimensions of the value chain. For example, a sizeable portion of hog production and processing is vertically integrated. In addition, hog packers often further process pork products (e.g. bellies and hams), in which case the fresh wholesale product moves through the supply chain simply by intra-firm transfers without being sold in the market. As we explore issues and concerns about wholesale pork pricing and price reporting, our focus is on sales of fresh products from hog processors to pork processors, retailers, food service, and export customers.

Three broad market arenas, 1) retail items, 2) processing cuts, and 3) variety meats, are the core of the wholesale pork market. Pork products that flow from hog processors directly to retailers and food service are referred to as “retail items” in Exhibit 2.1.1 and include products largely from loins, ribs, picnics, and butts. Pork that goes into further processing before going to retail, “processing cuts,” includes bellies, hams, and trimmings. Finally, hog processors market several variety meats. As we review wholesale pork price reporting, these markets are our major interest. Because retail items and processing products represent the vast majority of overall wholesale carcass value, they are our main focus in this study. The calculated composite of the three broad product category prices are combined by AMS into what is referred to as a carcass cutout. The carcass cutout is an estimate of the market value of a 53-54% lean 200 pound hog carcass based on current wholesale product prices.

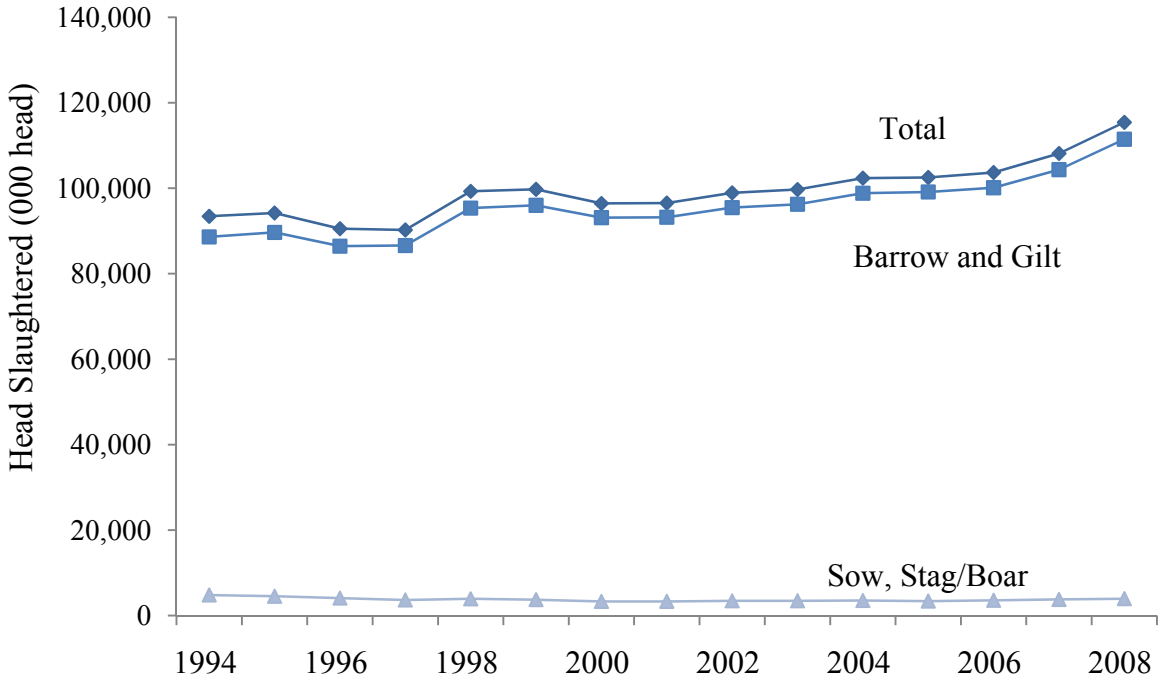
Exhibit 2.1.1 Schematic Representation of Pork Value Chain



2.2 HOG PRODUCTION

Total hog production increased by 25% from the mid 1990's to 2008 (Exhibit 2.2.1). In 2008, federally inspected industry hog slaughter was 115 million head, of which 97% was barrows and gilts and the rest were cull sows, stags, and boars. This rapid industry growth in itself is an interesting development whose discussion and trends are well beyond the scope of this report.[4] Suffice it to say, the industry has experienced robust expansion over the past decade largely through increased production efficiency and productivity.

Exhibit 2.2.1 Barrow and Gilt, Sow, and Stag/Board Annual Slaughter, 1994-2008[5]

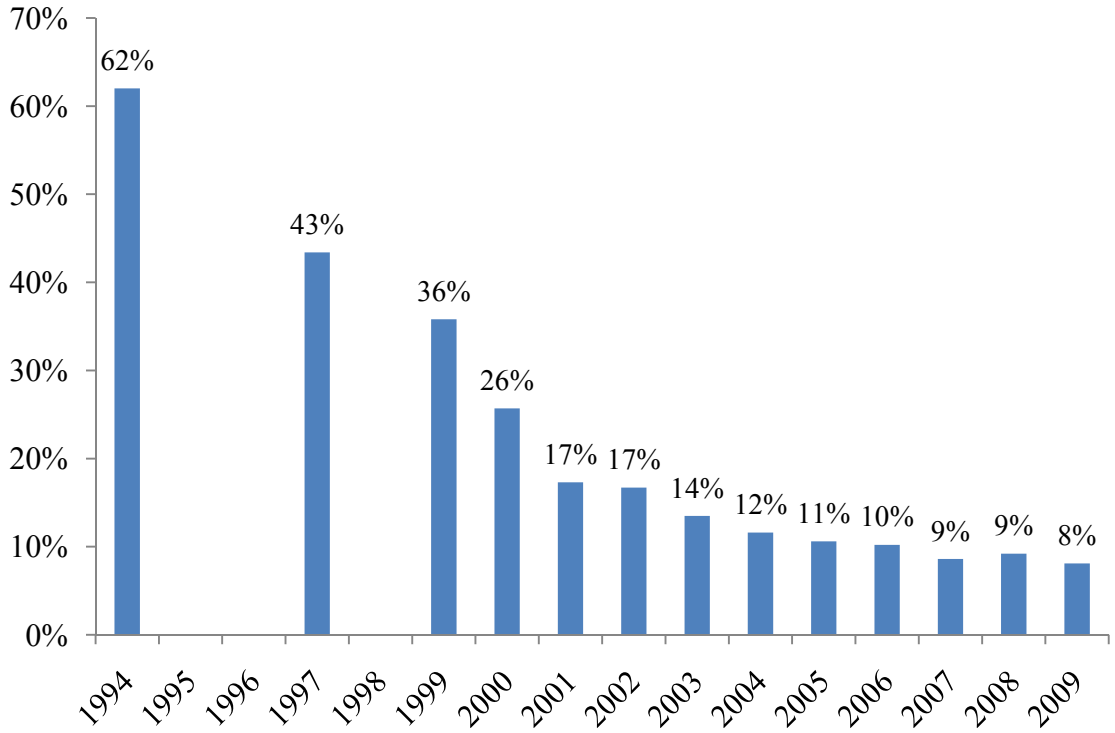


At the same time hog production was expanding, a major shift occurred in how live hogs were sold by producers to hog processors (Exhibit 2.2.2). In 1994, 62% of hogs were sold through negotiated cash markets. However, by 2007 cash negotiated sales had declined to less than 10% of trade.[6] Further breakdown of hog sales methods are provided in Exhibit 2.2.3. Much of the reduction in cash negotiated hog sales has been a result of increases in packer-owned hogs which represented 26% of all hogs sold (or transferred inter-firm) in 2009. Formula pricing of hogs has been common for several years representing about 45-50% of annual sales. Formula pricing is of particular direct interest in this study for hogs sold using the USDA wholesale cutout reported price as a base price. Although detailed history of how many hogs have been sold under formula pricing using the USDA wholesale

[4] See Key and McBride, 2007, for a discussion of the hog industry structure.
[5] USDA, ERS (Red Meat Yearbook)
[6] See Martinez and Zering, 2004, for a discussion of the role of quality control and industry organization and use of contracts.

pork cutout price as a base does not exist, about six percent of all market hogs were sold this way in 2007 (Grimes, 2009, personal communication).

Exhibit 2.2.2 Percentage of Hogs Purchased on Negotiated Cash Market, 1994-2009[7]



[7] Grimes and Plain (2009a)

Exhibit 2.2.3 Percentage of U.S. Hogs Sold using Various Pricing Arrangements, January 1999-2009[8]

Pricing Arrangement	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Hog or meat market formula	44.2	47.2	54.0	44.5	41.4	41.4	39.9	41.8	38.3	37.1	41.2
Other market formula	3.4	8.5	5.7	11.8	5.7	7.2	10.3	8.8	8.5	11.0	7.9
Other purchase arrangement	14.4	16.9	22.8	8.6	19.2	20.6	15.4	16.6	15.2	13.4	11.6
Packer-Sold				2.1	2.2	2.1	2.4	2.6	6.7	6.1	5.6
Packer-Owned				16.4	18.1	17.1	21.4	20.0	22.7	23.1	25.7
Negotiated-Spot	35.8	25.7	17.3	16.7	13.5	11.6	10.6	10.2	8.6	9.2	8.1

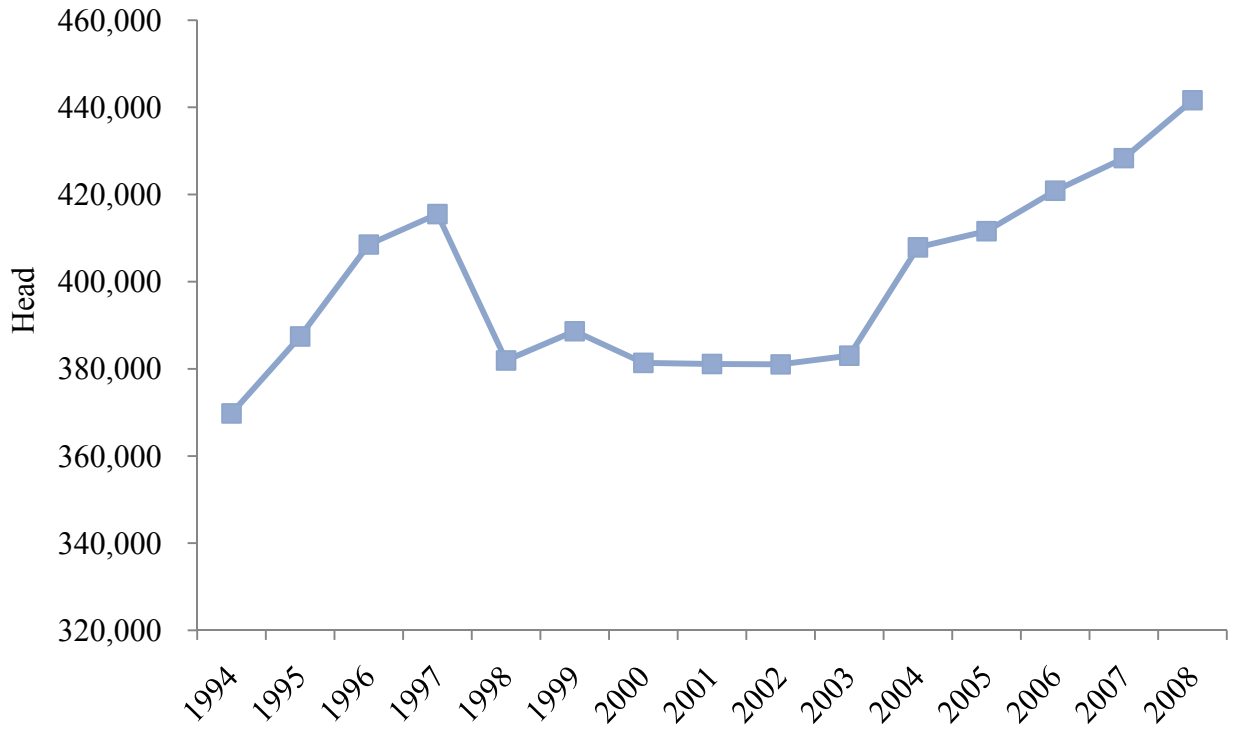
Note: In 2006, 2007, and 2008 data were reported to USDA voluntarily; in 2002 through 2005 and in 2009 reporting to USDA was mandatory; 1999-2001 data is based on industry surveys by the Univ. of Missouri.

[8]Grimes and Plain (2009b)

2.3 HOG PROCESSING

Daily hog slaughter capacity in the United States increased by over 50,000 head (13%) from the early 2000's to 2008, mirroring the increase in hog production (Exhibit 2.3.1). Over the past couple of decades, hog processing has become much more consolidated with a reduction in number of firms that report to the Grain Inspection Packers and Stockyards Administration going from 446 in 1980 to 128 in 2006 (Exhibit 2.3.2). In addition to processor firm consolidation, the number of slaughter plants has also declined dramatically from 509 in 1980 to 159 in 2006. In 2006, 28 plants slaughtered 1,000,000 head or more and represented about 89% of slaughter (Exhibit 2.3.3).

Exhibit 2.3.1 Daily US Slaughter Capacity, 1994-2008[9]



[9]Meyer (2009)

Exhibit 2.3.2 Hog Processing Firm and Plant Numbers, Selected Years, 1980-2006[10]

	Number of Reporting Packers			
Year	**Single Plant firms**	**Multi-Plant Firms**	**Total Firms**	**Total Plants**
1980	408	38	446	509
1985	297	41	338	403
1990	264	26	290	335
1995	182	27	209	245
2000	132	20	152	186
2003	111	14	125	154
2004	120	16	136	166
2005	112	19	131	163
2006	114	14	128	159

Exhibit 2.3.3 2006 Hog Processing Plant Size Distribution[11]

Less than 1,000		**1,000-9,999**		**10,000-24,999**		**25,000-49,999**	
Plants No.	**Head** Thous.	**Plants** No.	**Head** Thous.	**Plants** No.	**Head** Thous.	**Plants** No.	**Head** Thous.
15	6	34	135	17	258	16	609
50,000-99,000		**1000,000-299,000**		**300,000-999,999**		**1,000,000 or more**	
Plants No.	**Head** Thous.	**Plants** No.	**Head** Thous.	**Plants** No.	**Head** Thous.	**Plants** No.	**Head** Thous.
22	1,542	15	2,489	12	6,382	28	93,127

2.3.1 BARROW AND GILT PROCESSORS

The daily slaughter capacity of barrow and gilt processors in 2009 is presented in Exhibit 2.3.1.1. Currently all barrow and gilt processing plants that slaughter at least 100,000 head of swine per year on average for the immediate preceding five years are required to report hog purchase prices to AMS under rules of the Livestock Mandatory Reporting Act of 1999. This would equate to hog processing plants slaughtering roughly 400 head per day being subject to this reporting requirement, or roughly 50 barrow and gilt plants owned by some 30 companies reporting prices.[12] The geographic dispersion of barrow and gilt slaughter plants is illustrated in Exhibit 2.3.1.2. Most of the plants subject to current hog price reporting, and certainly the largest volume of hogs represented, are located in the Southeastern (e.g., NC, VA, and SC) and Midwestern (e.g., IA, IL, NE, MN, MO) regions of the United States, with a few also located in the West (e.g., CA).

[10]USDA, GIPSA (2007)
[11]USDA, GIPSA (2007)
[12] These are only rough estimates of firms and plants because we only have access to estimated slaughter capacity, not actual slaughter by year by plant. Actual slaughter by plant is confidential data not made available to the research team.

Exhibit 2.3.1.1 U.S. Barrow and Gilt Processors and Daily Plant Slaughter Capacities, 2009[13]

Company		Plant	Capacity (head)	Co. Total
Smithfield		Tar Heel , NC	33,000	
Smithfield, Virginia		Gwaltney, VA	9,500	
	Morrell	Sioux Falls, SD	19,000	
		Sioux City, IA	14,000	
	Farmland	Crete, NE	10,500	
		Denison, IA	9,300	
		Monmouth, IL	10,500	
	Prem. Std.	Milan, MO	10,500	
		Clinton, NC	10,000	126,300
Tyson Foods (IBP)		Waterloo, IA	19,350	
Dakota Dunes, SD		Logansport, IN	14,500	
		Storm Lake, IA	15,500	
		Col. Junction, IA	10,000	
		Madison, NE	7,800	
		Perry, IA	7,400	74,550
Swift		Worthington, MN	18,500	
Greeley, CO		Marshalltown, IA	18,500	
		Louisville, KY	10,000	47,000
Excel		Beardstown, IL	20,000	
Wichita, KS		Ottumwa, IA	18,500	38,500
Hormel		Austin, MN	19,000	
Austin, MN		Fremont, NE	10,500	
	Clougherty	Los Angeles, CA	7,500	37,000
Seaboard Farms		Guymon, OK	19,200	
Triumph Foods		St. Joseph, MO	19,000	
Indiana Packing Co.		Delphi, IN	16,500	
Hatfield Quality Meats		Hatfield, PA	10,600	
J.H Routh		Sandusky, OH	4,200	
Sioux-Preme Packing		Sioux Center, IA	4,200	
Greenwood Packing		Greenwood, SC	3,000	
Pork King Packing		Marengo, IL	2,000	
Premium Iowa Pork		Hospers, IA	2,400	
Fisher Ham and Meat		Spring, TX	1,500	
		Navasota, TX	500	2,000

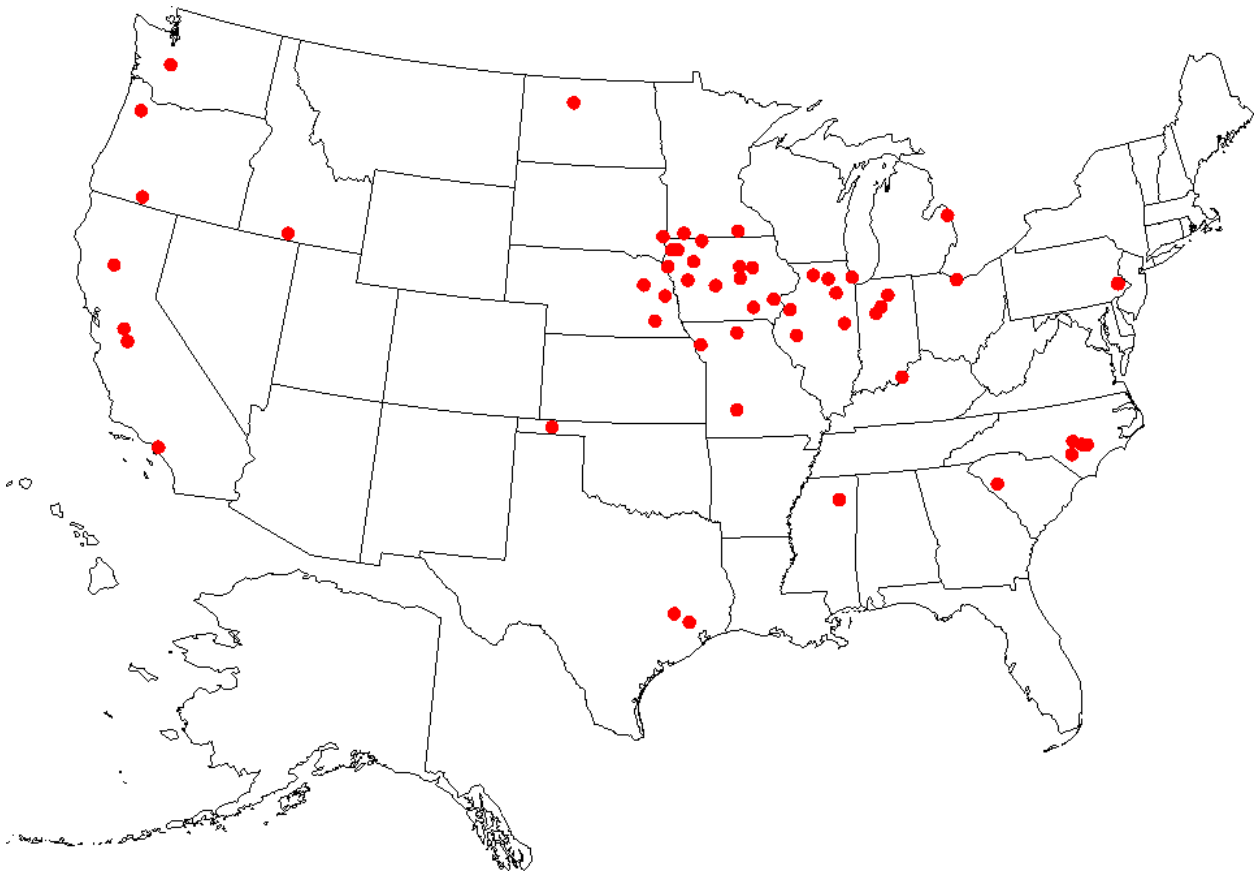
[13] Meyer, 2009

Exhibit 2.3.1.1 (cont.) U.S. Barrow and Gilt Processors and Daily Plant Slaughter Capacities, 2009[14]

Company	Plant	Capacity (head)	Co. Total
Spectrum Meats	Mount Morris, IL	1,600	
Yosemite Meats	Modesto, CA	1,500	
Dakota Pork, Inc	Estherville, IA	1,500	
Leidy's	Souderton, PA	1,400	
Vin-Lee-Rom	Mentone, IN	1,300	
Martin's Pork Products	Falcon, NC	1,300	
Heritage Acres Foods	Pleasant Hope, MO	1,200	
Verschoor Meats	Sioux City, IA	1,200	
Olson Meat Company	Orland, CA	1,000	
The Pork Company	Warsaw, NC	900	
Jim's Farm Meats	Atwater, CA	850	
Cloverdale Foods	Minot, ND	800	
Independent Meats	Twin Falls, ID	750	
Peoria Packing	Chicago, IL	600	
Masami Meat Company	Klammath Falls, OR	550	
Dekalb Packing Company	De Kalb, IL	500	
Parks Family Meats	Warsaw, NC	450	
Carleton Packing Company	Carleton, OR	375	
Morris Meat Packing	Morris, IL	300	
VanDeRose Farms	Wellsburg, IA	250	
Dealaman Eterprises, Inc.	Warren, NJ	200	
Weltin Meat Packing	Minden City, MI	175	
Southern Quality Meats	Pontotoc, MS	150	
Dayton Meat Co.	Dayton, OR	100	
Kapowsin Meats, Inc.	Graham, WA	100	

[14]Meyer, 2009

Exhibit 2.3.1.2 Geographic Locations of US Barrow and Gilt Processing Plants, 2009[15]



2.3.2 SOW AND BOAR PROCESSORS

Sow and boar processor capacity data are listed in Exhibit 2.3.2.1. Much like barrow and gilt processors, any sow and boar slaughter plant with annual slaughter of more than 100,000 head (or about 400 head per day) on average over the past five years is subjected to mandatory reporting of swine purchases to AMS. In addition, in the reauthorization of the Act in 2006, the following phrase was added to amend the definition of a swine processor subjected to mandatory reporting "…the term packer also includes a person that slaughtered an average of at least 200,000 sows, boars, or combination thereof per year during the immediately preceding five (5) calendar years" (*Federal Register* p. 28,607).[16] In effect, what this amendment did was add to the list of swine processors required to report purchase prices to AMS those with several small plants that individually may not qualify under the original rule but when there plant slaughter was added together would qualify under the new rule. Sow and boar processing plants are located mostly in the Southeastern, Midwest, and Southern Plains states (Exhibit 2.3.2.2).

[15] Created from data obtained through Meyer, 2009
[16] Public Law 109-296 (120 Stat. 1464).

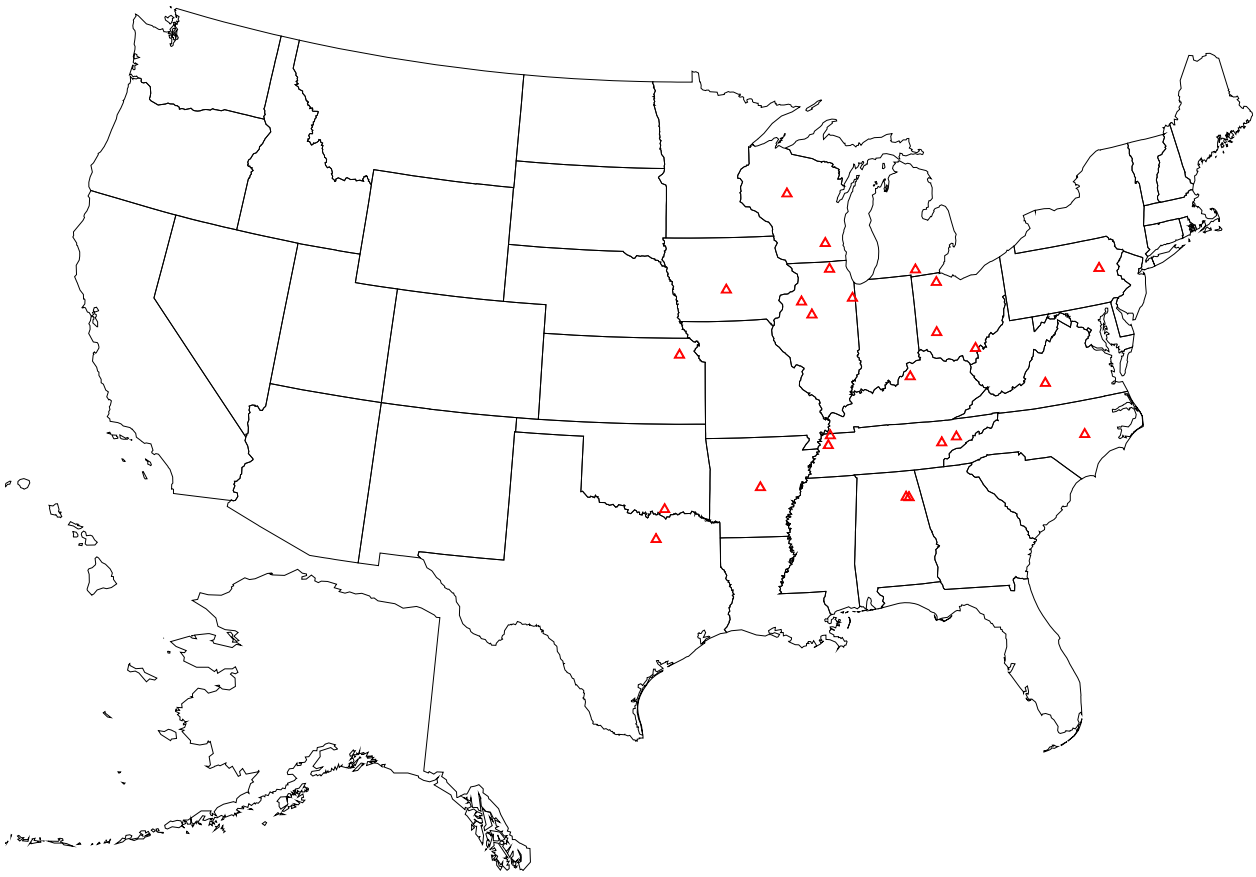
Exhibit 2.3.2.1 US Sow and Boar Processors and Daily Plant Slaughter Capacities, 2009[17]

Company	Plant	Capacity (head)
Johnsonville Foods	Watertown, WI	650
	Momence, IL	1,600
	Holton, KS	1,000
Pine Ridge Farms	Des Moines, IA	2,850
Jimmy Dean (Sara Lee)	Newburn, TN	2,800
Pork King Packing	Marengo, IL	2,000
USA Pork Products*	Hazellton, PA	2,000
Abbyland Foods	Curtiss, WI	2,000
Bob Evans Farms	Bidwell, OH	220
	Xenia, OH	330
	Hillsdale, MI	330
	Galva, Il	330
	Richardson, TX	440
Odom's Sausage	Little Rock, AR	1,000
Calihan Packing Company	Peoria, IL	450
Pioneer Packing Company	Bowling Green, OH	425
F.B. Purnell Sausage	Simpsonville, KY	400
J.C. Potter Sausage	Durant, OK	400
Williams Sausage Company	Union City, TN	400
Swaggerty Sausage Co	Kodak, TN	300
Dean Sausage	Atalla, AL	250
Wampler's Sausage	Lenoir City, TN	225
Southern Pride Meats	Goldsboro, NC	210
Avco	Gadsen, AL	205
Gunnoe Sausage	Goode, VA	110

* USA Pork Products kills 80% boars, 20% butcher hogs

[17]Meyer, 2009

Exhibit 2.3.2.2 Geographic Locations of US Sow and Boar Processing Plants, 2007[18]



Sow and Boar Reporting Sentiment

When one discusses the pork supply chain, a clear distinction must be made between products originating from barrow and gilt slaughter and those from sow and boar slaughter facilities. The latter is largely comprised of a whole hog sausage product, while the former contains a full range of primal and sub-primal products that AMS uses in its calculation of pork cutout values.

It was noted in multiple discussions with industry participants that nearly all meat transactions originating from sow and boar facilities would not be considered eligible for AMS reporting. In particular, the majority of these transactions are intra-firm transactions associated with additional processing typically in line with value-added procedures designed to differentiate sausage products. Survey respondents indicated a preference for AMS to capture sow and boar meat trade, but respondents may not be fully aware of USDA confidentiality regulations that we expect would result in compliance costs that would exceed the value of resulting price information.

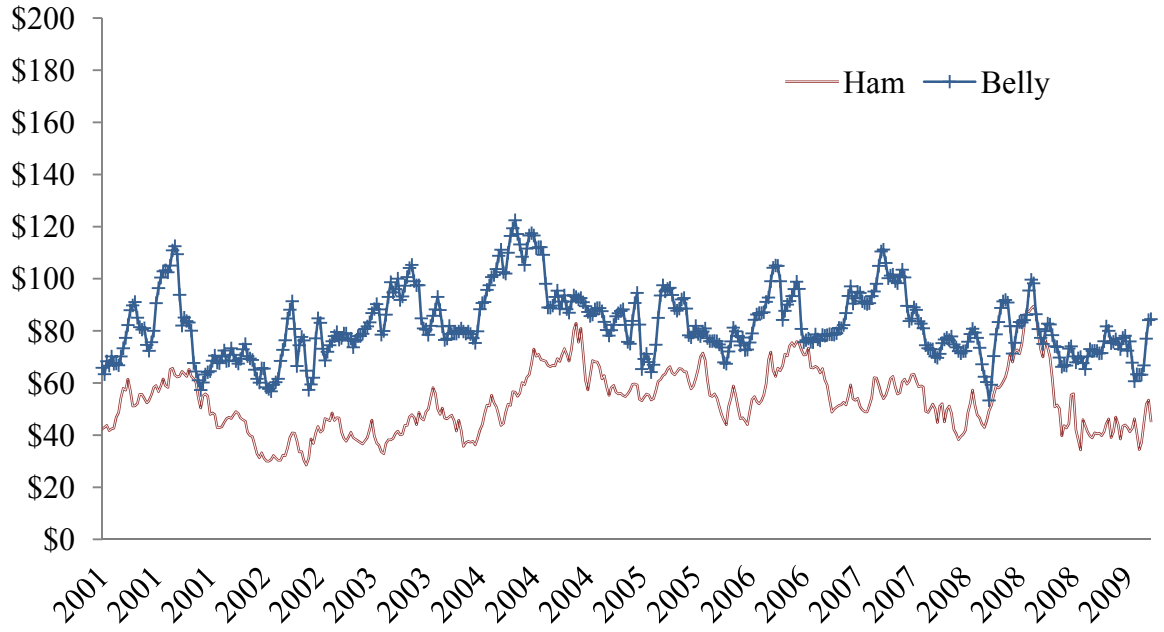
[18] Created from data obtained through Meyer, 2009

Based on broad industry feedback related to challenges related to capturing sow and boar meat trade and the general lack of interest in capturing sow and boar meat trade, this project focused on barrow and gilt slaughter and associated wholesale pork market.

2.3.3 VALUE OF PORK PRIMALS

Weekly average prices over the 2001 to October 2009 period as reported by AMS for individual pork primals and the calculated pork cutout are reported in Exhibits 2.3.3.1 through 2.3.3.3. Pork prices vary considerably over time, with highest prices being 100% or more above the lowest prices. This reveals the magnitude of price variation firms face in the wholesale pork industry. Furthermore, individual primals have different price patterns over time. Thus, having individual price reports for each primal is important for individual product market information, price discovery, risk management, and formula pricing.

Exhibit 2.3.3.1 Weekly Average AMS Reported Wholesale Pork Prices ($/cwt) for Processing Cuts, 2001-October 2009[19]



[19] LMIC (2009)

Exhibit 2.3.3.2 Weekly Average AMS Reported Wholesale Pork Prices ($/cwt) for Retail Cuts, 2001-October 2009[20]

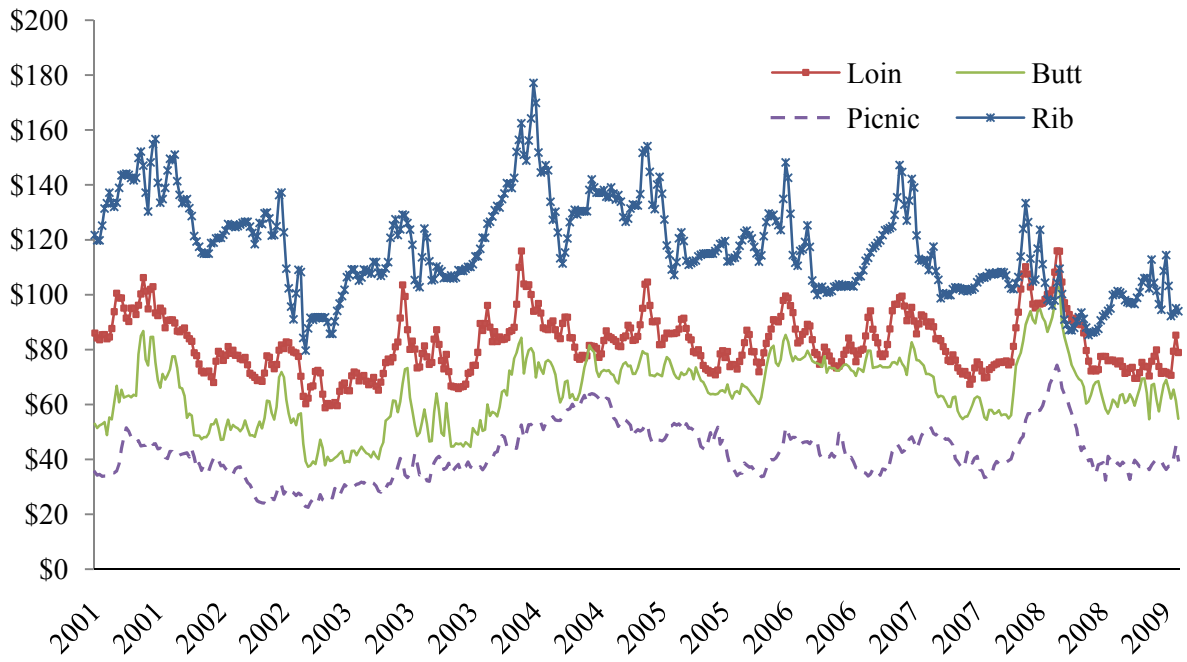
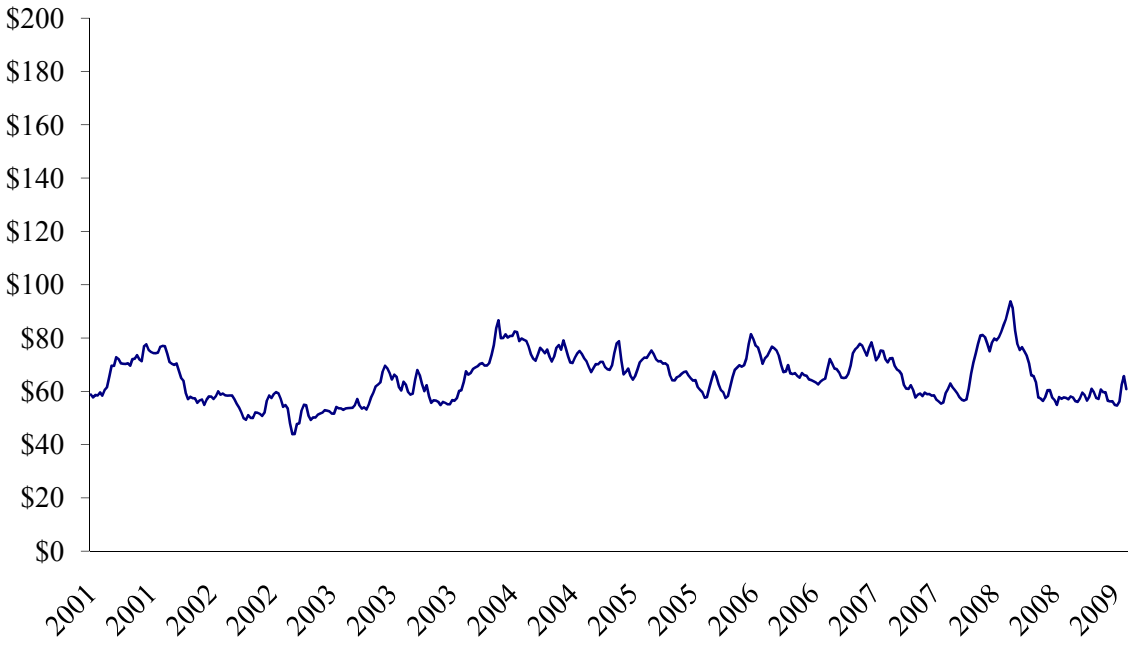


Exhibit 2.3.3.3 Weekly Average Pork Carcass Cutout Prices ($/cwt), 2001-October 2009[21]



[20] LMIC (2009)
[21] LMIC (2009)

2.4 COLD STORAGE STOCKS

Pork cold storage stocks are an important component of the pork value chain (see Exhibits 2.4.1 through 2.4.8). However, pork that is sold from cold storage stocks is not considered part of AMS price reporting.[22] In most instances, hog processors initiate the movement of product from fresh into cold storage. Wholesale pork primal cold storage seasonality occurs within a given calendar year, reflecting seasonal hog supply and seasonal demand for particular primal. For example, hog production has tended to historically spike during the fall. Thus, hog processors may move excess pork meat into cold storage during fall months to balance supply spikes. Some pork products also experience significant seasonal demand spikes: Ham demand spikes during Thanksgiving to Christmas. Hog processors respond to such market signals by warehousing cold storage stocks at times of low demand, relative to supply (i.e. low prices). This is not to say the buyer has not already committed to purchase the products (forward purchase) for future delivery, but the product is withheld from the market until a later date.

Export balancing refers to the process of building cold storage stocks of certain products in response to fluctuations in export. Note, pork exports, as a percent of total domestic pork disappearance, has increased from 6.45% in 1999 to 19.38% in 2008 (see Exhibit 2.5.1). For example, Butt export demand has grown substantially. But, other pork primals are not as popular in international markets. For instance, loins are not as favored outside the US. Thus, the buildup of pork loin cold storage stocks has trended up substantially over time (see Exhibit 2.4.3).

The following exhibits are used to summarize historical trends and within year seasonality of pork meat cold storage stocks, by primal or variety meats. One can note seasonality by seeing the within year peaks and valleys.

[22] AMS currently captures pork transferred to cold storage if the transaction represented the initial sale of a fresh product. AMS does capture frozen product trade for boxed beef and boxed lamb under mandatory price reporting, and such information is reported separately from fresh meat trade.

Exhibit 2.4.1 Monthly Pork Belly Cold Storage Stocks, 1995-October 2009[23]

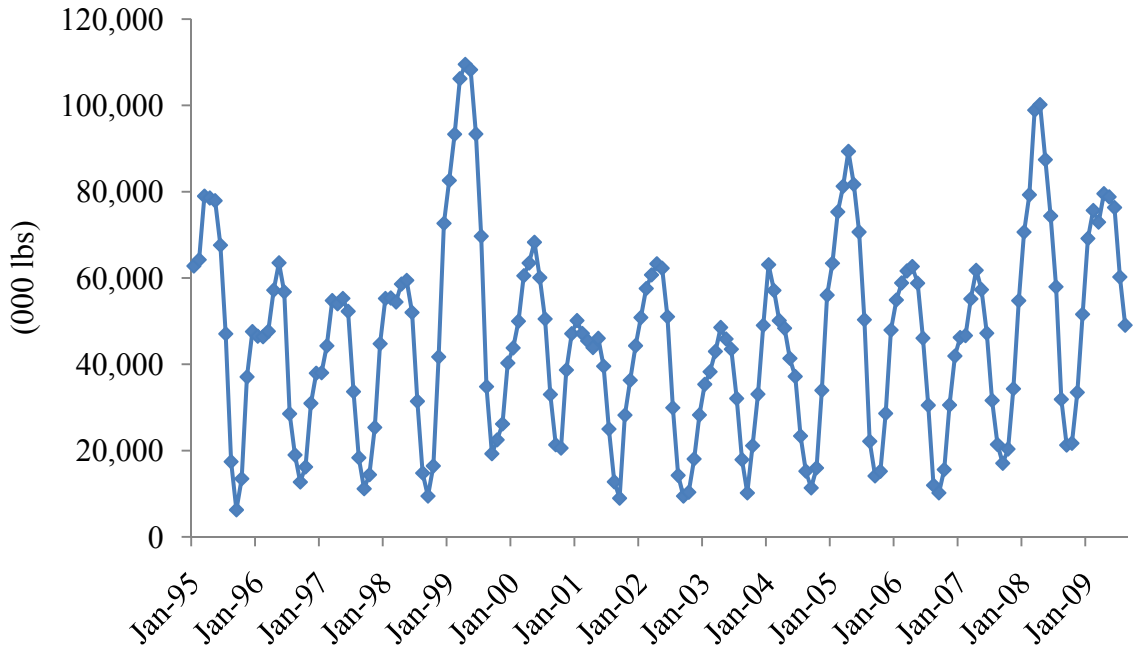
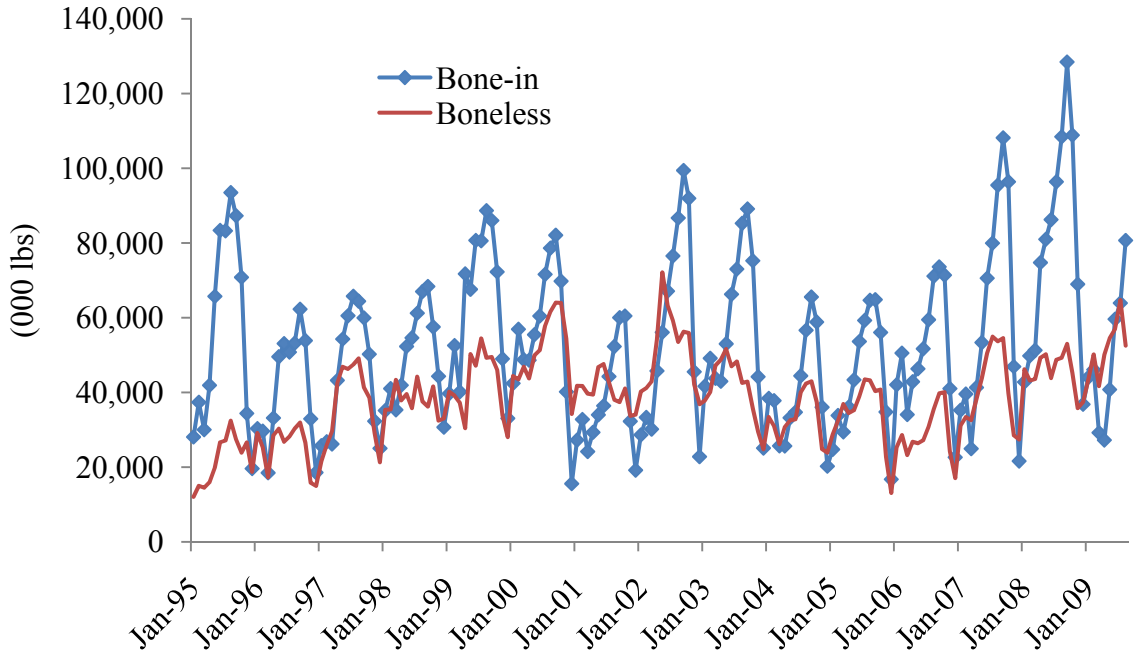


Exhibit 2.4.2 Monthly Ham Cold Storage Stocks, 1995-October 2009[24]



[23] USDA, NASS (Cold Storage Stocks Report)
[24] USDA, NASS (Cold Storage Stocks Report)

Exhibit 2.4.3 Monthly Pork Loins Cold Storage Stocks, 1995-October 2009[25]

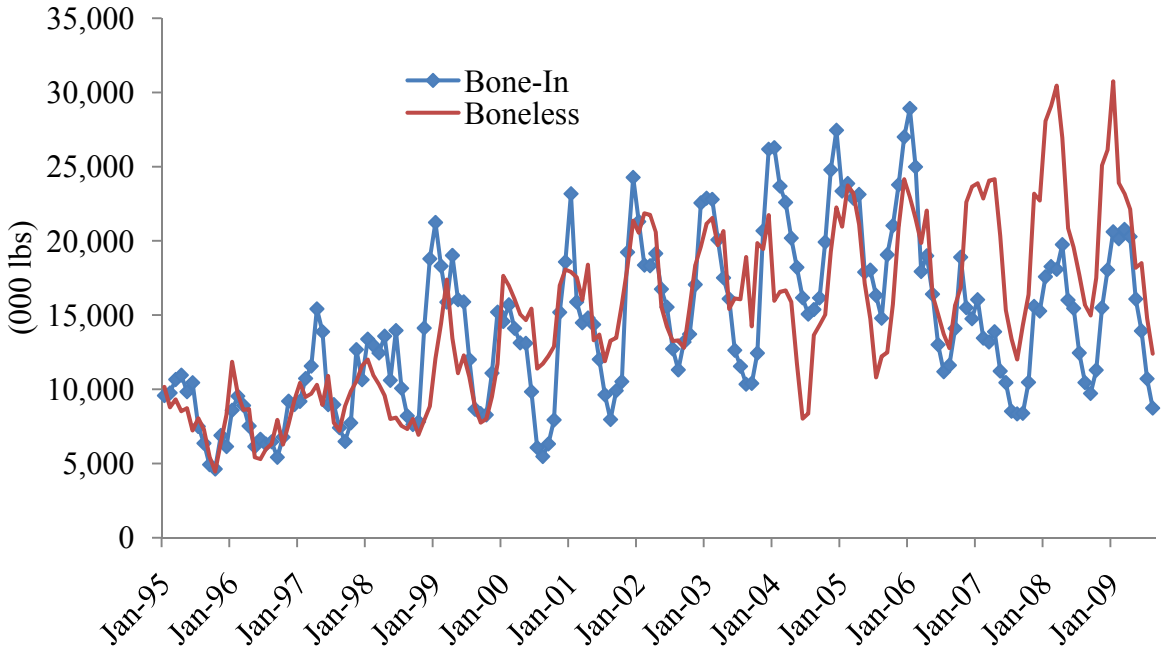
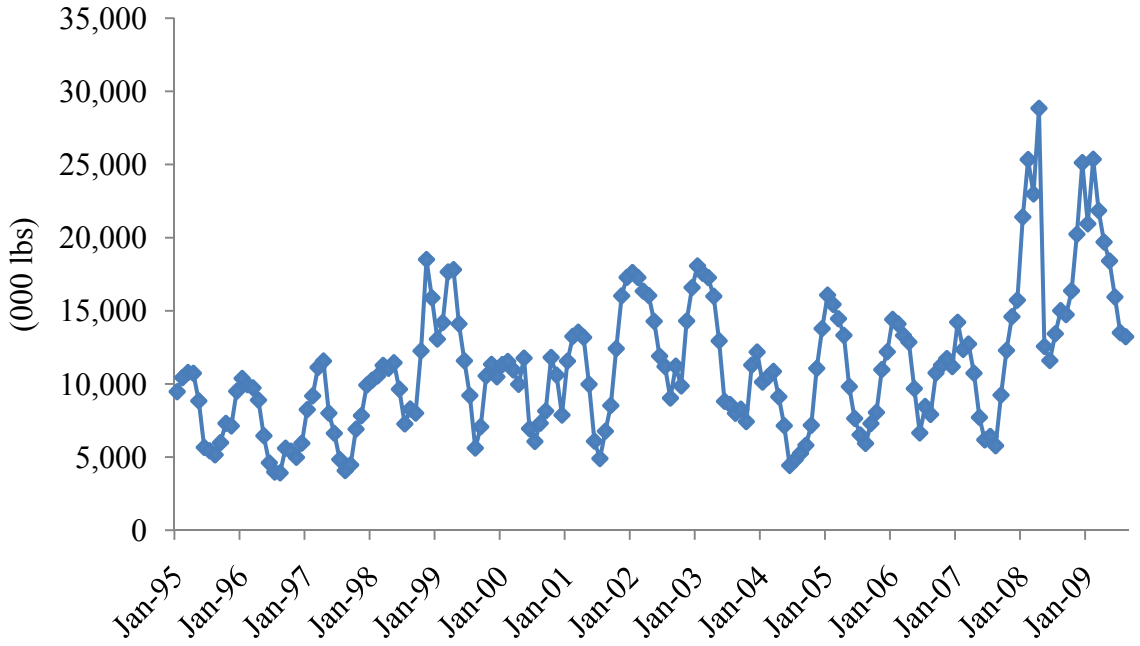


Exhibit 2.4.4 Monthly Butt Cold Storage Stocks, 1995-October 2009[26]



[25] USDA, NASS (Cold Storage Stocks Report)
[26] USDA, NASS (Cold Storage Stocks Report)

Exhibit 2.4.5 Monthly Spare Ribs Cold Storage Stocks, 1995-October 2009[27]

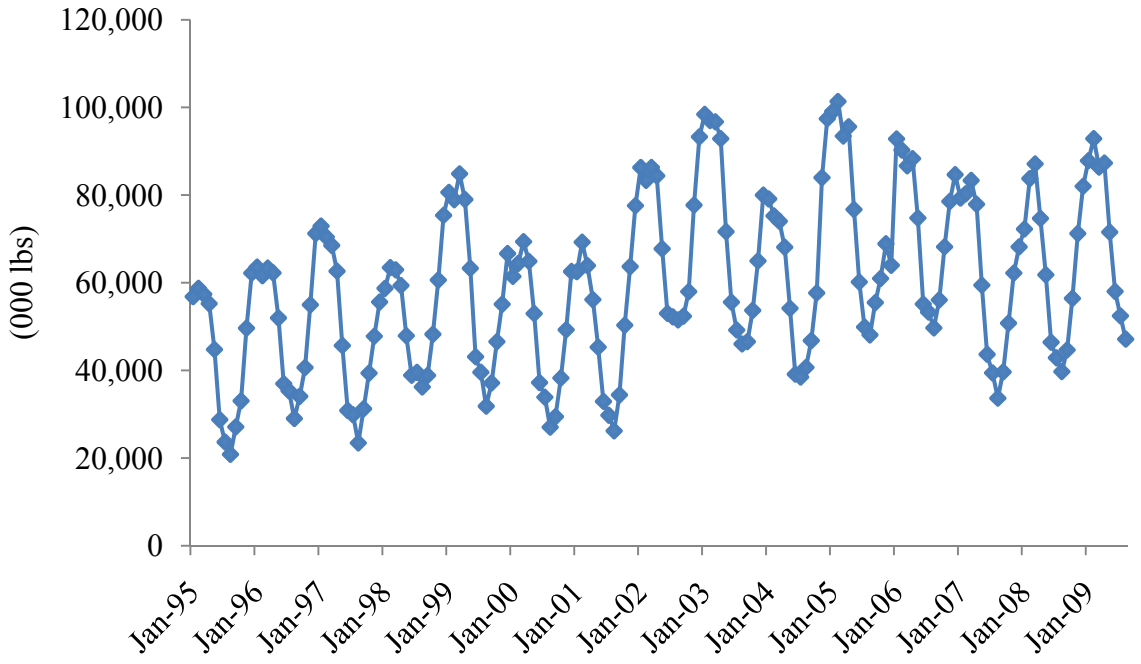
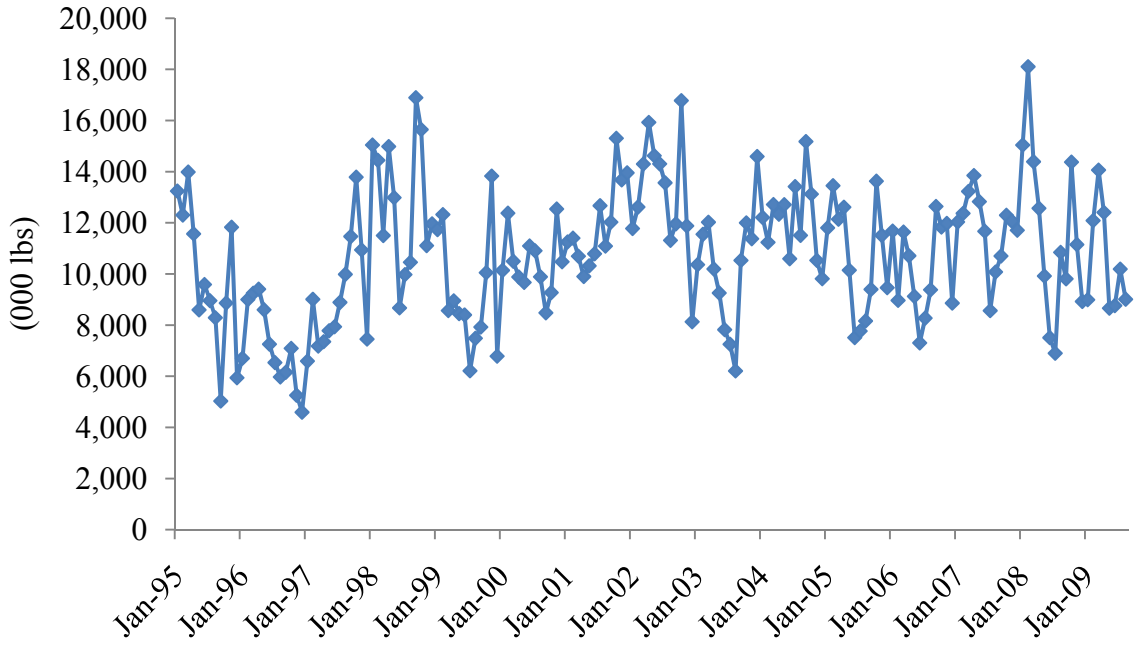


Exhibit 2.4.6 Monthly Bone-in Picnic Cold Storage Stocks, 1995-October 2009[28]



[27] USDA, NASS (Cold Storage Stocks Report)
[28] USDA, NASS (Cold Storage Stocks Report)

Exhibit 2.4.7 Monthly Variety Pork Meat Cold Storage Stocks, 1995-October 2009[29]

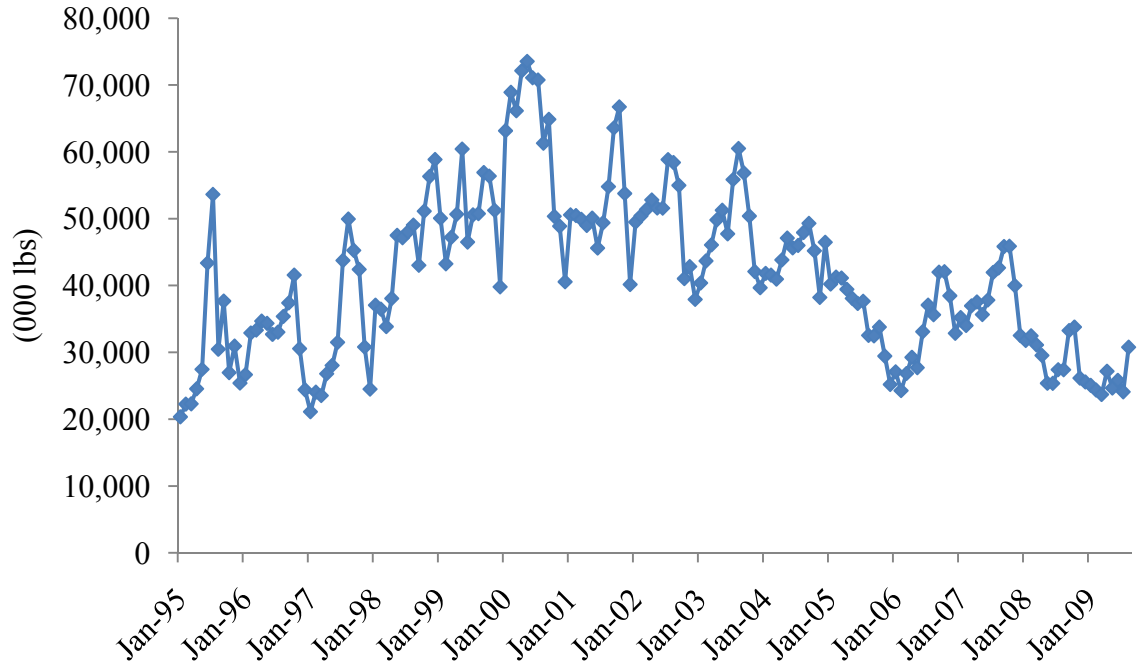
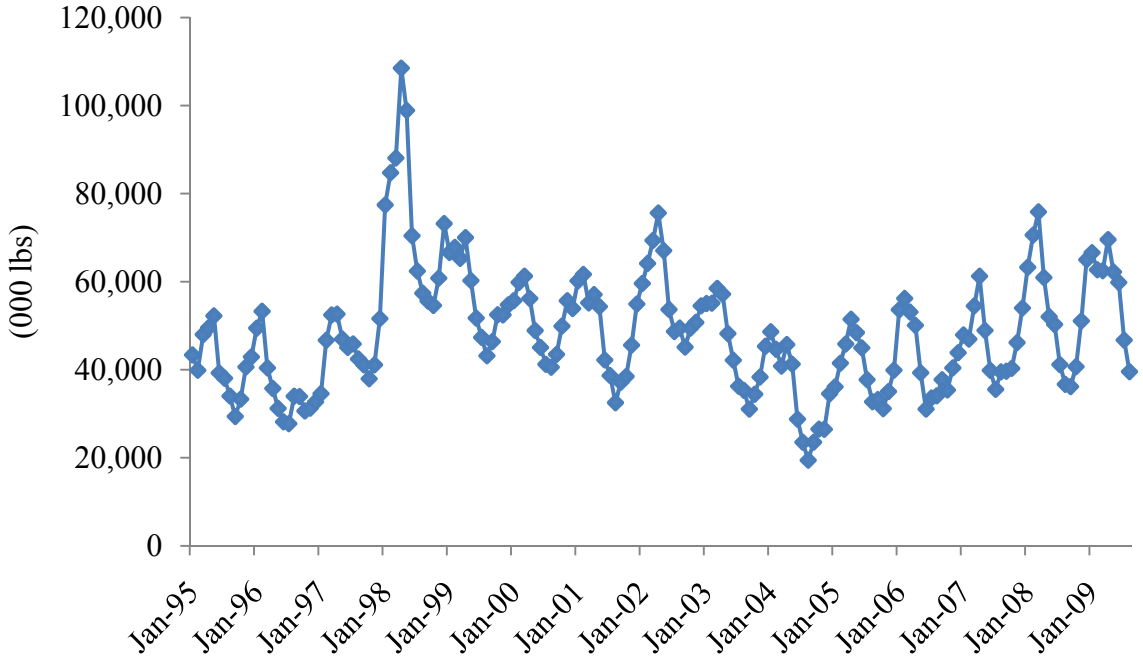


Exhibit 2.4.8 Monthly Pork Trimmings Cold Storage Stocks, 1995-October 2009[30]



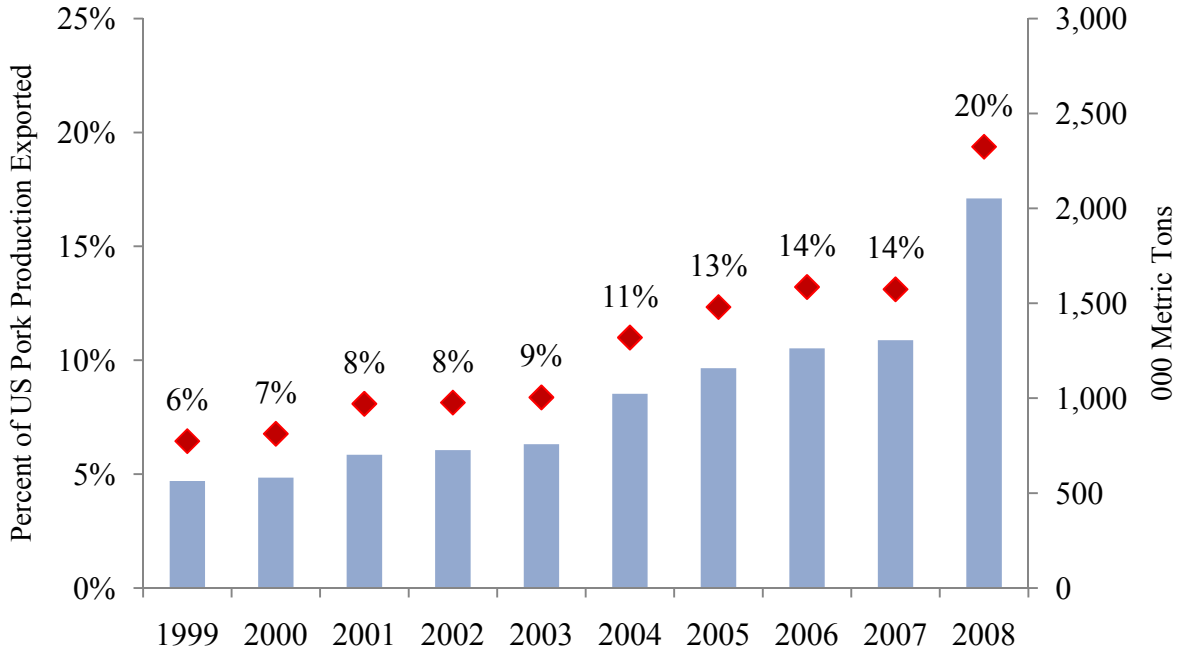
[29] USDA, NASS (Cold Storage Stocks Report)
[30] USDA, NASS (Cold Storage Stocks Report)

2.5 EXPORTS

Domestic pork exports have increased both in total volume and as a percentage of production (Exhibit 2.5.1). In 2008, nearly 20% of U.S. pork production was marketed to foreign customers, compared to slightly less than seven percent in 2000.[31] Major importers of U.S. pork are Japan, China, Mexico, and Russia (Exhibit 2.5.2). During 2008, neighboring countries Mexico and Canada accounted for 23.4% of U.S. pork exports (Exhibit 2.5.2). Pork and by-product export sales have significantly increased over the past 20 years, resulting in a growing contribution of pork exports to the value of live hogs (Exhibit 2.5.3).

Of particular interest is pork exports constituting trade within North American Free Trade Agreement (NAFTA) countries. Exhibits 2.5.4 through 2.5.7 show U.S. pork export trends to Mexico, Canada, and the rest-of-the-world. These data exclude variety meats and by-products. Pork export trade to Canada and Mexico has increased over time, but realized a slower volume increase than pork exports to the rest-of-the-world (Exhibit 2.5.4). A large portion of U.S. pork exports to the rest-of-world has been in frozen form (Exhibit 2.5.5). U.S. frozen pork exports to Mexico have remained constant over time but have increased for Canada. Prepared and preserved pork exports to Canada and Mexico have increased substantially (Exhibit 2.5.6). Similarly, pork cut exports in fresh/chilled state to Mexico and Canada have trended upward but at a much slower rate than to the rest-of-the-world (Exhibit 2.5.7).

Exhibit 2.5.1 U.S. Pork Export Volume and Percentage of Pork Export Volume Relative to U.S. Pork Production, 1999-2008[32]



[31] USDA, FAS (WASDE)
[32] USDA, FAS (WASDE)

Exhibit 2.5.2 U.S. Pork Exports by Country, Percentage Volume Shares, 2008[33]

Country	% of U.S. Exports
Japan	28.4
China (mainland) and Hong Kong	18.2
Mexico	14.4
Russia	9.2
Canada	9.0
South Korea	6.4
Australia	2.3
China (Taiwan)	1.2
Other	10.8

Exhibit 2.5.3 Value of U.S. Pork and Byproduct Exports per Head of Total U.S. Slaughter, 1986-2008[34]

Year	Value of Pork	Value of Byproducts	Total
1986	$1.05	$0.92	$1.97
1987	$1.59	$1.10	$2.69
1988	$2.84	$1.62	$4.46
1989	$3.72	$1.35	$5.07
1990	$3.84	$1.51	$5.35
1991	$3.79	$1.71	$5.50
1992	$4.76	$1.66	$6.42
1993	$5.20	$1.61	$6.81
1994	$5.73	$1.80	$7.53
1995	$8.79	$1.83	$10.62
1996	$11.02	$1.82	$12.84
1997	$11.36	$2.46	$13.82
1998	$10.17	$2.13	$12.30
1999	$10.86	$1.83	$12.69
2000	$12.34	$2.00	$14.34
2001	$14.17	$2.23	$16.40
2002	$13.42	$2.02	$15.44
2003	$13.80	$2.38	$16.18
2004	$18.15	$3.38	$21.53
2005	$22.01	$3.43	$25.44
2006	$23.97	$3.38	$27.35
2007	$25.21	$3.68	$28.89
2008	$35.35	$6.59	$41.94

[33] USDA, ERS (Hog Trade, 2009)
[34] Grimes and Plain (2009c).

Exhibit 2.5.4 Annual Fresh, Chilled, and Frozen Pork Exports, by Destination, 1989-2008[35]

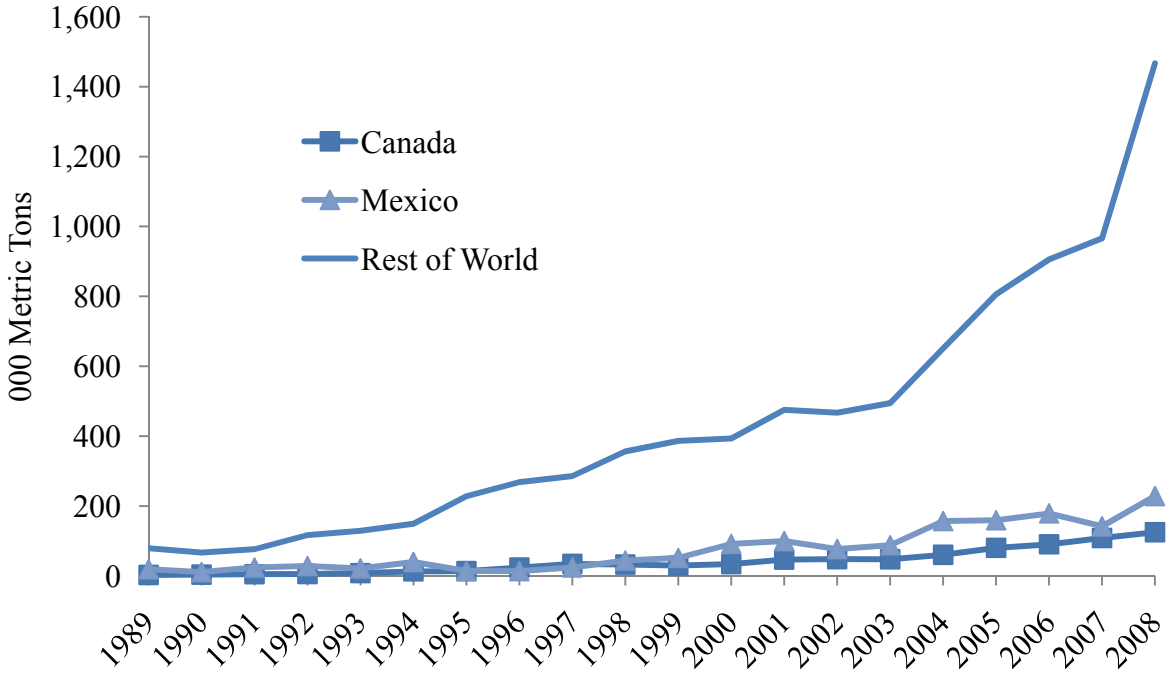
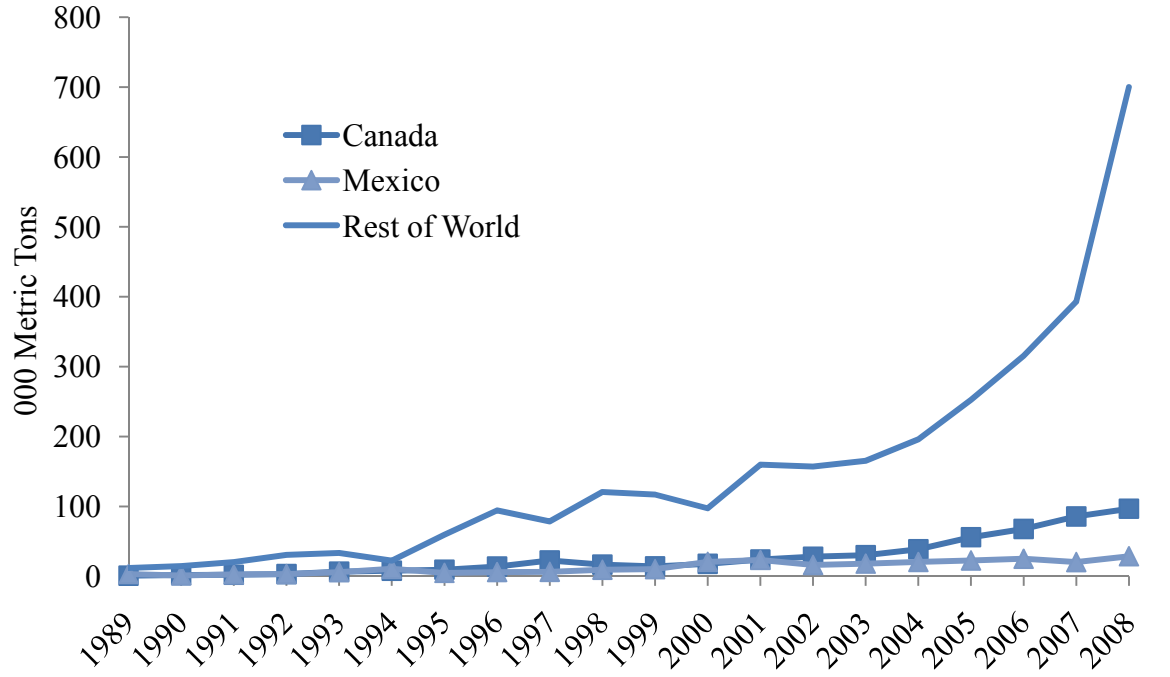


Exhibit 2.5.5 Annual Frozen Pork Exports, by Destination, 1989-2008[36]



[35] USDA, FAS (GATS, 2009), does not include offal, variety meat, or carcasses.
[36] USDA, FAS (GATS, 2009), does not include offal, variety meat, or carcasses.

Exhibit 2.5.6 Annual Prepared, Preserved Pork Exports, by Destination, 1989-2008[37]

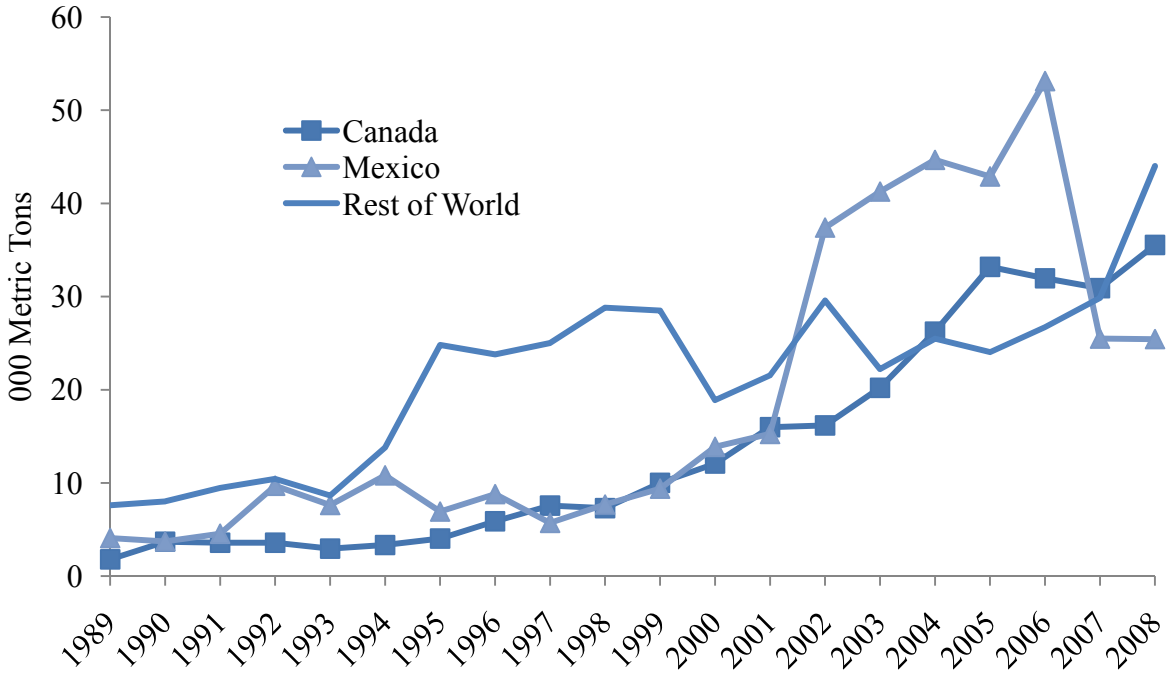
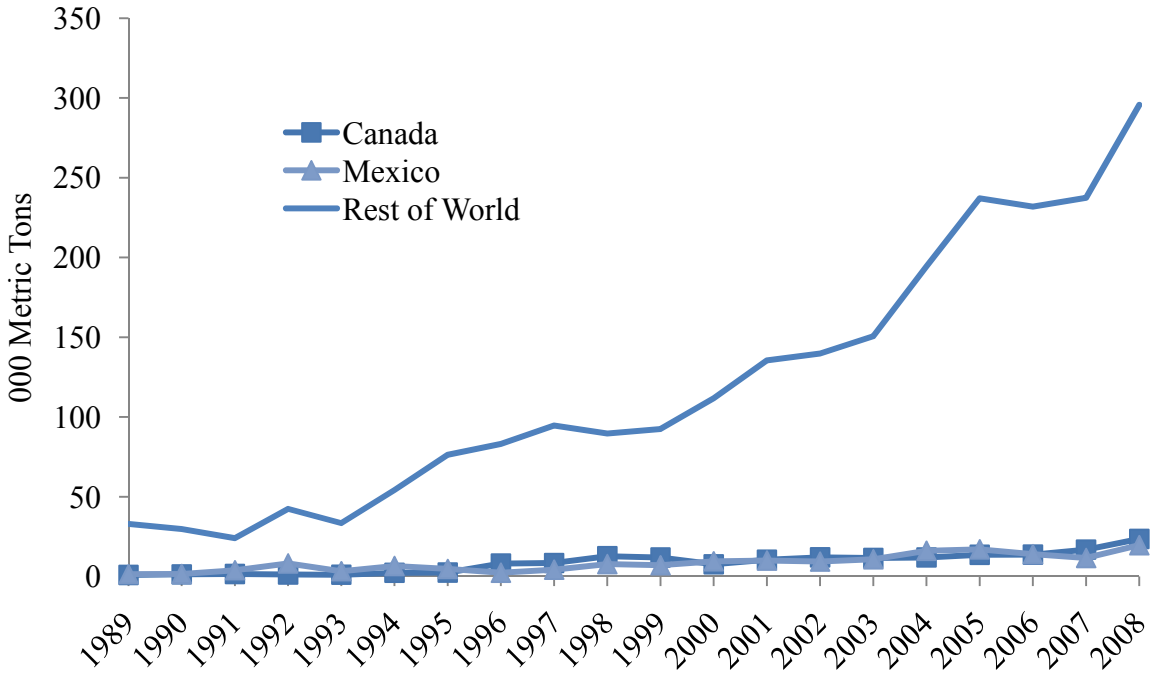


Exhibit 2.5.7 Annual Fresh/Chilled Pork Cut Exports, by Destination, 1989-2008[38]



[37] USDA, FAS (GATS, 2009), does not include offal, variety meat, or carcasses.
[38] USDA, FAS (GATS, 2009), does not include offal, variety meat, or carcasses.

CHAPTER 3: VOLUNTARY WHOLESALE PORK PRICE REPORTING

3.1 OVERVIEW

The United States Department of Agriculture Agricultural Marketing Service (AMS) is responsible for public price reporting in the wholesale pork market. Currently, wholesale pork price reporting is completed by AMS market reporters from the Des Moines, IA USDA offices. AMS marker reports gather information daily about wholesale pork market trade to develop market news reports. AMS reports are subsequently posted on public AMS websites. For instance, the '*USDA NATIONAL CARLOT PORK REPORT*' is built from this information.[39]

The process AMS follows in wholesale pork price reporting is multi-faceted. Here, we provide simply an overview of this process to provide a context of current practices. The AMS Reporters Handbook (LGMN Instruction No. 933-10) contains additional details on the specific procedures AMS follows.

The data gathering process primarily reflects information being collected via phone conversations between AMS market reporters, hog processors, and pork buyers. Participation by pork sellers and buyers in these conversations is entirely voluntary. This information gathering process results in AMS possessing a range of variables on the wholesale pork market, principally including prices and quantities traded on specific pork products (e.g., 23-27 lb hams).

In addition to publishing information on individual pork products, AMS calculates values for six major pork primals (Loin, Butt, Picnic, Sparerib, Ham, Belly)[40] that are released in daily AMS reports. Moreover, AMS calculates a Pork Carcass Cutout from primal prices that is designed to reflect the value of a 53-54% lean, 200 lb hog carcass.[41] The Pork Carcass Cutout estimate is intended to provide industry participants with a publically available indicator of overall supply and demand conditions in the wholesale pork market. More narrowly, by releasing information on specific pork primals and sub-primal products, AMS market news reports aim to provide specific supply and demand information on select components of the hog carcass being traded in the wholesale pork market.

The current AMS wholesale pork price reporting system is focused on capturing information from negotiated cash market. Transactions eligible for reporting must have trade occur within 10 days for retail products (e.g., loins, picnics, butts, and ribs) and seven days for processed products (e.g., ham and bellies). Any transaction scheduled to physically occur beyond these 10- and seven-day windows is reported by AMS in an out-front report (NW_LS449).. Moreover, to be eligible for reporting, AMS has minimum load requirements

[39] This report is available at http://www.ams.usda.gov/mnreports/nw_ls500.txt.
[40] AMS also calculates values for a Primal Jowl, Hind Feet, Neck Bones, Tails, Front Feet, and Cut Loss that alter, albeit slightly, the ultimate calculated Composite Cutout Value.
[41] For more information see "USDA Estimated Composite Pork Carcass Cutout – An Overview." Available at: http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRD3484991.

that must be met before a price is publicly released. Minimum load requirements range from 0.125 loads (5,000 lbs) for cushion picnics to 1.5 loads (60,000 lbs) for bone-in loins. The use of different minimum load requirements across products reflects variation in the volume of pork products in the industry as well as the proportion of trade that may be eligible for AMS reporting. Furthermore, transactions occurring within a given business entity (say from a hog packer to ham processor owned by the packer), often referred to as *inter-firm* or *intra-firm* transactions, are ineligible for AMS reporting.

Currently, AMS reports wholesale pork prices on an FOB-Omaha basis. That is, AMS adjusts reported prices for transportation to standardize reports from nationally-dispersed transactions to reflect a common location. Furthermore, AMS precludes pork destined for export markets and pork trading in any form besides fresh (e.g., frozen, cured, case-ready) in their wholesale market reports.

Given the voluntary nature of pork price reporting, AMS also attempts to confirm reported transactions by conversing with both parties of a reported transaction. The voluntary nature of current reporting alleviates AMS from concerns regarding confidentiality of industry participants in market news reports. That is not to imply that AMS discloses sources of pricing information, but rather they do not concern themselves with the number of firms reporting a single product price during a day for example.

Currently, voluntary price reporting allows AMS reporters to adjust product attributes being tracked and specific products made eligible for market news reports without obtaining Congressional approval. For instance, as product specifications change (say weights of hams being traded), AMS has the ability to alter the market news reports it releases.

Finally, it is important to note the breadth of wholesale pork price data use. Obvious uses include establishing a market sentiment for transacting fresh wholesale pork trade, as a base for formula pork trade, for establishing inter- and intra-company transfer prices, and for hog marketing contracts which are tied to the AMS pork cutout value. Other uses of the price information include Economic Research Service calculation of the farm-wholesale-retail price spread (Hahn, 2004), market intelligence gathering on processor margins (by hog producers, pork buyers, retailers, and consultants), for evaluation of policy recommendations (e.g., Muth et al., 2007), for structural change analysis (e.g., price-quantity relationship over time, Parcell, 2003; Parcell, Mintert, Plain, 2004), marketing margins (e.g., Marsh and Brester, 2004) or as an evaluation tool for risk management as in the case of the pork belly futures contract (e.g., Murphy, 2009).

3.2 AMS DATA ANALYSIS

To determine how price reporting on individual products has changed over time, we analyzed daily AMS reported pork trade data from January 1, 2001 to October 23, 2009. In particular, we obtained historical daily wholesale pork market price and volume trade data from USDA AMS, similar to that currently provided in NW_LS500 reports.[42]

As shown in Exhibit 3.2.1 the majority (17 of 22 cuts) of the important pork cuts regularly tracked by AMS, had higher reported load (40,000 lbs) volumes over the 2001-2003 period than during the 2007-2009 period. Coupling this with the fact that U.S. pork production increased by about 20% from 2001 to 2009 (Exhibit 2.3.1) suggests that over time the AMS pork price reporting system is capturing a declining share of wholesale pork trade. Exhibits 3.2.2 through 3.2.7 confirm this individually for different pork primals.[43] Similarly, Exhibit 3.2.8 demonstrates AMS reports reflect a declining share of wholesale pork trade at the carcass level.

While analyzing average reported load volume is informative, it is also useful to consider volatility in reported load volume over time. The annual coefficient of variation (COV) in daily AMS reported load volume is reported in Exhibit 3.2.9. The COV of daily reported load volume is greater for 21 of the 22 wholesale pork products in the 2007-2009 period compared to the 2001-2003 period. For example, the coefficient of variation in daily reported volume for a bone-in 17 to 20 pound ham increased from 0.66% to 1.72% from 2001-2003 to 2007-2009. Thus, average load volume reported has declined and variation in load count represented has increased over time. However, the key implication is that a smaller portion of wholesale pork trade is represented in daily AMS reports, and variation in how much trade is reported each day is increasing.

Another assessment of daily transaction data at the product/cut level included an evaluation of how frequently AMS was unsuccessful in reporting a current day's transaction. Prior to January 2006, AMS used subscripts to denote old transactions (i.e., an "a" denoted yesterday's value) in daily published price reports. That is, instead of having a missing price printed in the report, AMS filled in the blank with the most recently reported price from past reports. Beginning in January 2006, AMS discontinued the practice of filling in missing price data with previous prices and instead began leaving blanks in a daily report if no reportable trade was available. Exhibit 3.2.10 reflects this and summarizes the frequency for which a current day's transaction was not available (i.e., frequency of non-reported trade days). For example, boneless picnic prices were reported by AMS on about half the days during 2001-2003. The patterns of change in non-reported trade days over the 2001-2009 period varied notably across products. In particular, 12 of the 22 products experienced a higher frequency of non-reported trade days in the 2007-2009 period than the 2001-2003 period. During 2007-2009, 10 of the 22 products have prices reported less than half of the time. During times of high market price volatility, as has been witnessed during 2007-2009,

[42] A current example is available at: http://www.ams.usda.gov/mnreports/nw_ls500.txt.
[43] The reported Exhibits here may differ from AMS estimates due to the denominator used. We use barrow and gilt production (carcass weight).

not having reported prices available for important pork products creates significant problems for those trying to negotiate trades.

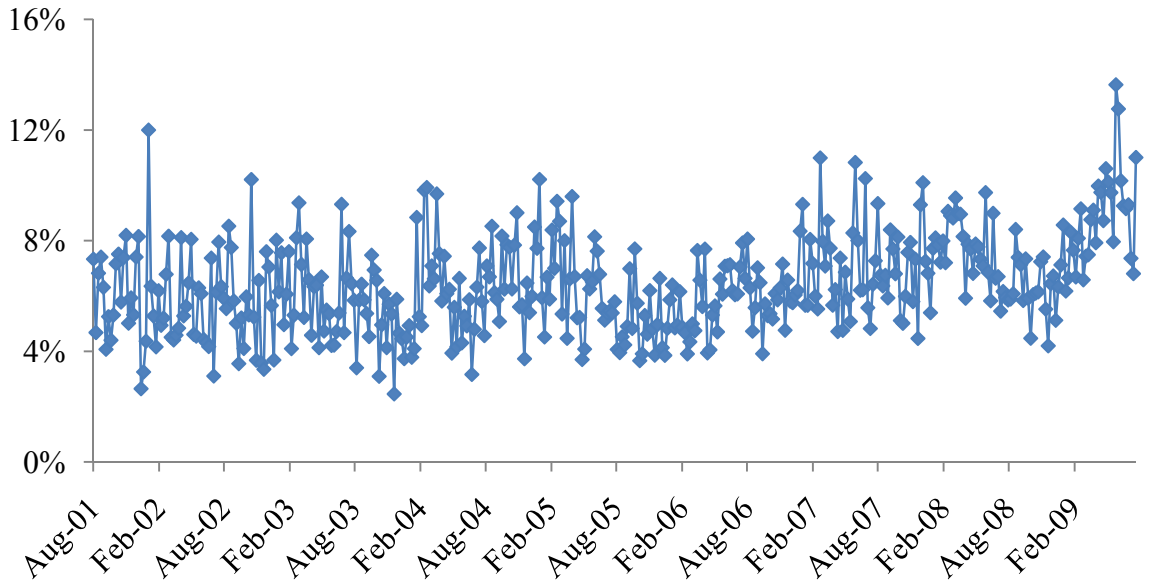
In addition to examining daily AMS reported pork trade data, we assessed weekly reported data. In particular, we used daily reported data in our assessment of individual pork cuts while all analyses of pork primals and cutout reports was conducted using weekly reported data from January 1, 2001 to July 31, 2009. Exhibits 3.2.11 and 3.2.12 summarize the relative contribution of individual pork primals towards the total load counts included in AMS weekly reports. Comparing the 2001-2003 and 2007-2009 periods, Exhibit 3.2.11 reveals that over time loins, butts, and ribs comprise an increasing portion of total reported loads. In contrast, picnics, hams, bellies, and trim are providing a diminishing share of total reported loads. This is consistent with the more general trend of more processed products (e.g., hams and bellies) making up less of the reported loads and retail products (e.g., loins, butts, and ribs) making up more of the load volume (proportionally) over time. Moreover, this is consistent with the notion that valued-added enhancements to products such as hams may be increasingly missed (less contribution in load counts) in the reported cutout values by AMS.

In addition to assessing how primals are changing in their relative contributions to AMS reports, it is important to investigate if current contributions towards load counts are consistent with the value contribution each primal makes in AMS cutout calculations. By comparing Exhibit 3.2.12 and 3.2.13, we observe the contributions to load volumes by loins, butts, and ribs are over represented and picnics, hams, and bellies are underrepresented, relative to their cutout value contributions. That is, the current relative volume of pork trade captured by AMS is higher for loins, butts, and ribs and lower for picnics, hams, and bellies. This trend is particularly problematic for price discovery regarding pork cutouts. For instance, note that hams and bellies combine to currently represent over 40% of the total value in AMS cutout calculations. However, during the 2007-2009 period less than 24% of the total pork transactions captured by AMS came from ham and belly trades.

Exhibit 3.2.1 Average Load Volume Reported in Daily AMS Wholesale Pork Trade, 2001-October 2009[44]

Pork Product	2001-2003	2004-2006	2007-2009
Loin, Bone-in, 1/4" Trim 21#/DN-LGT	7.24	5.43	5.23
Loin, Bone-in, 1/8" Trm/less 21#DN-LGT	5.10	2.17	3.58
Loin ¼" Cntrcut, Bnls Strp-On, 10-11 Rib 5-11#	2.98	2.75	3.99
Loin ¼" Cntrcut, Bnls Strp-Off, 10-11 Rib 5-11#	4.82	5.51	5.62
Loin, Bnls Sirloin .75-1.5#	1.60	0.99	1.21
Picnic, Bnls, Fresh 72% combo	3.41	1.56	0.73
Butt, ¼" Trim 5-10#	9.64	7.13	9.76
Butt, ¼" Trim Steak Ready 5-10#	3.80	1.00	0.80
Butt, 1/8" Trim Steak Ready 5-10#	3.16	2.04	2.88
Spareribs, 2/bag, 3 bags PCVAC 4.25/up#-MED	1.91	1.48	2.71
Ham, Bone-in, Trimmed 17-20#, Trim Spec 1	3.56	1.72	0.66
Ham, Bone-in, Trimmed 20-23#, Trim Spec 1	8.97	5.23	2.92
Ham, Bone-in, Trimmed 23-27#, Trim Spec 1	8.72	6.05	4.88
Ham, Bnls 94-96%, 4 Muscle Group	1.58	1.11	3.35
Ham, Bnls 94-96%, 5 Muscle Group	2.13	0.49	1.17
Belly, Sdls, Skin-on, Trimmed, 12-14#	2.59	0.52	1.26
Belly, Sdls, Skin-on, Trimmed, 14-16#	3.61	1.12	1.75
Belly, Sdls, Skin-on, Trimmed, 16-18#	2.55	0.93	0.81
Fresh 42% combo	4.54	2.97	1.83
Fresh 72% combo	7.54	4.25	4.89
Fresh, Skinned Jowls	0.96	0.07	0.03
Fresh Trim,Visual Trace of Lean, 12-16% combo	0.86	0.39	0.25

Exhibit 3.2.2 Percentage of Weekly Pork Loin Production Captured Through Voluntary Price Reporting, 2001 – October 2009[45]



[44] USDA, AMS data; Constructed by Tonsor; and table reflects daily trade data through October 23, 2009.
[45] USDA, AMS data and LMIC; denominator is barrow and gilt production (carcass weight).

Exhibit 3.2.3 Percentage of Weekly Pork Picnic Production Captured Through Voluntary Price Reporting, 2001 – October 2009[46]

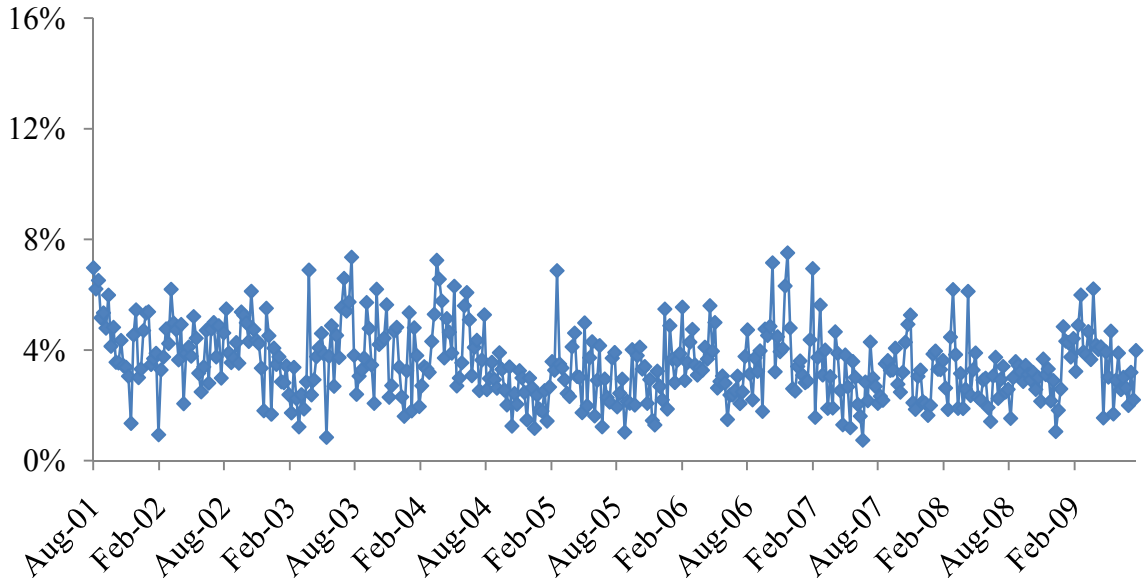
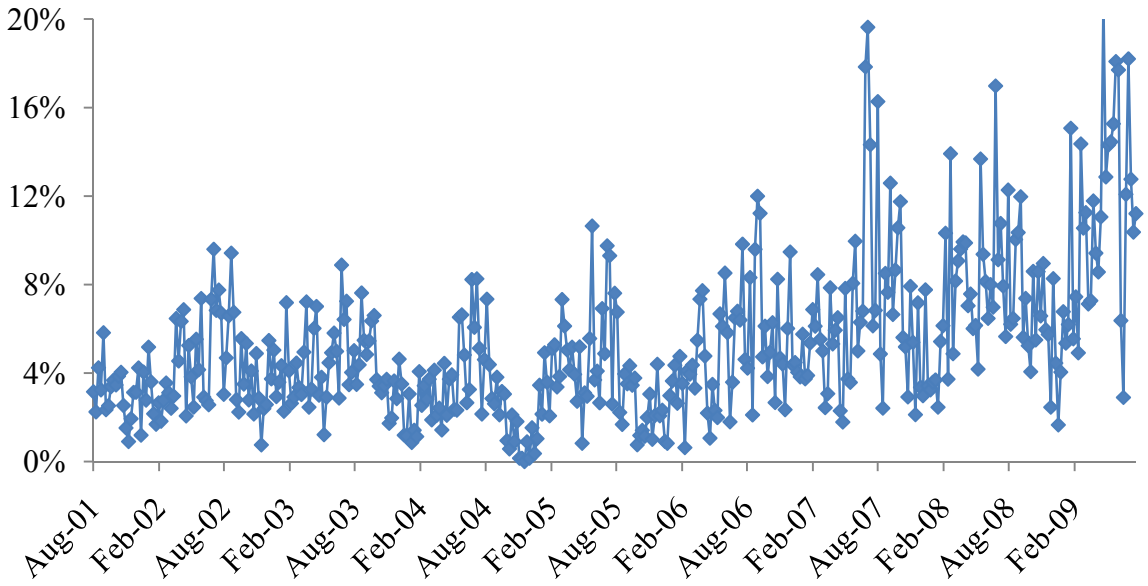


Exhibit 3.2.4 Percentage of Weekly Pork Rib Production Captured Through Voluntary Price Reporting, 2001 – October 2009[47]



[46] USDA, AMS data and LMIC; denominator is barrow and gilt production (carcass weight).
[47] USDA, AMS data and LMIC; denominator is barrow and gilt production (carcass weight).

Exhibit 3.2.5 Percent Weekly Pork Ham Production Captured Through Voluntary Price Reporting[48]

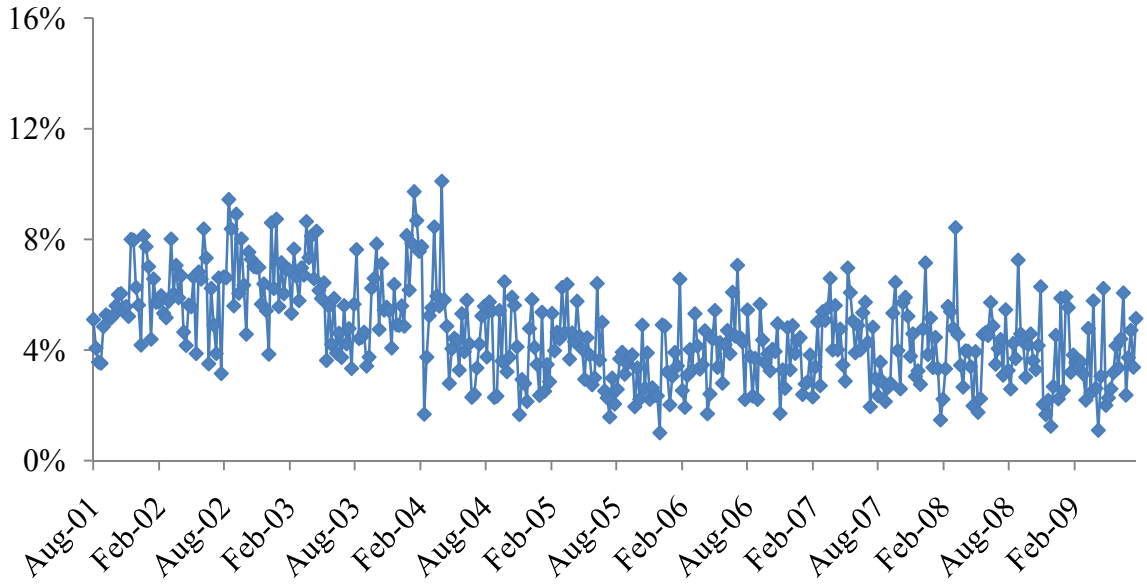
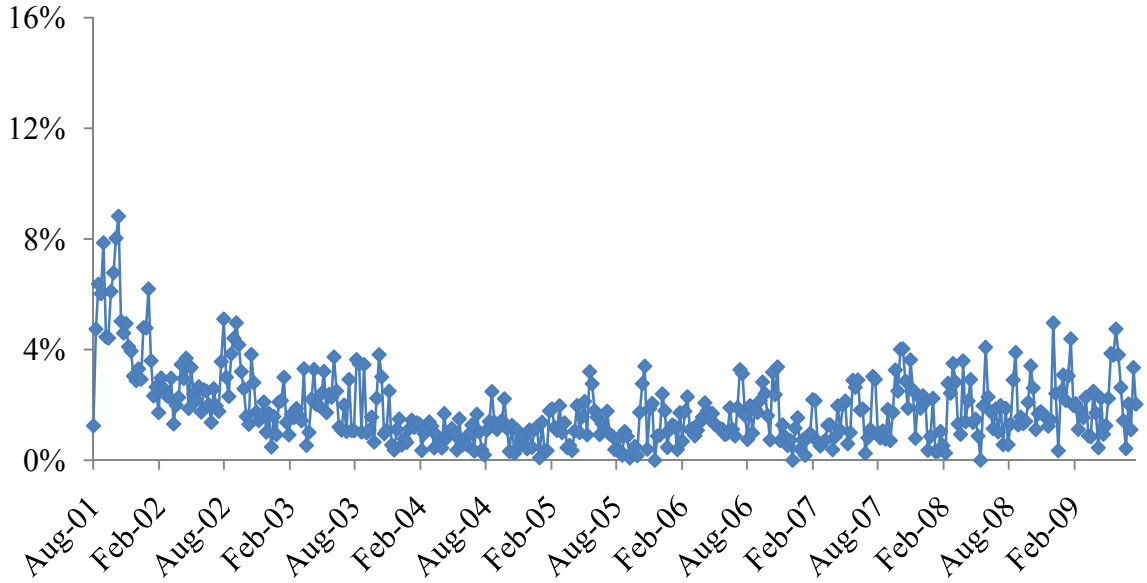


Exhibit 3.2.6 Percentage of Weekly Pork Belly Production Captured Through Voluntary Price Reporting, 2001 – October 2009[49]



[48] USDA, AMS data and LMIC; denominator is barrow and gilt production (carcass weight).
[49]USDA, AMS data and LMIC; denominator is barrow and gilt production (carcass weight).is.

Exhibit 3.2.7 Percentage of Weekly Pork Butt Production Captured Through Voluntary Price Reporting, 2001 – October 2009[50]

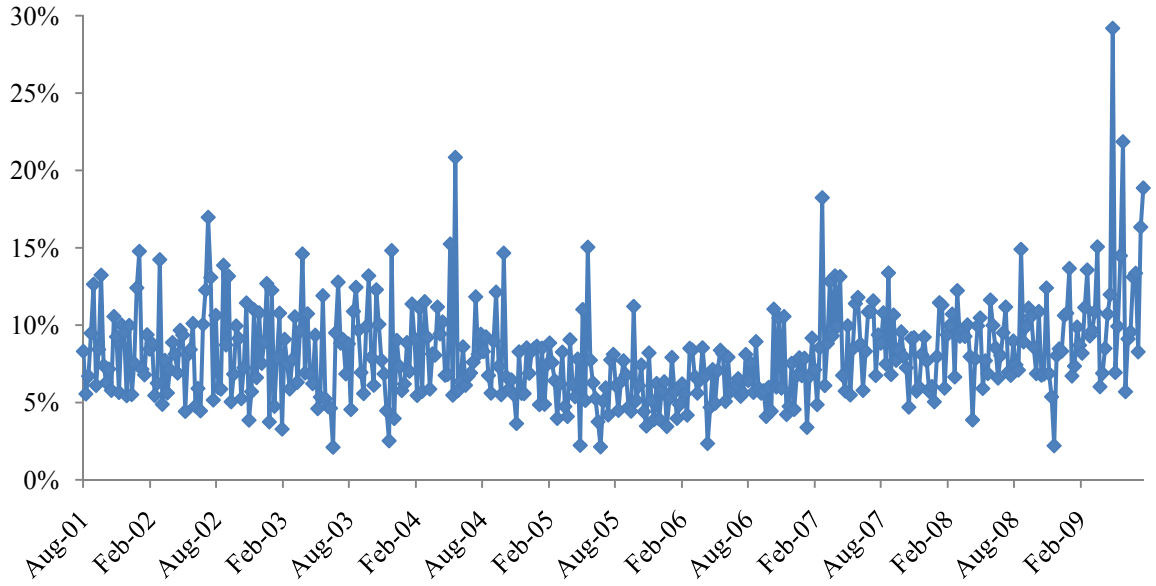
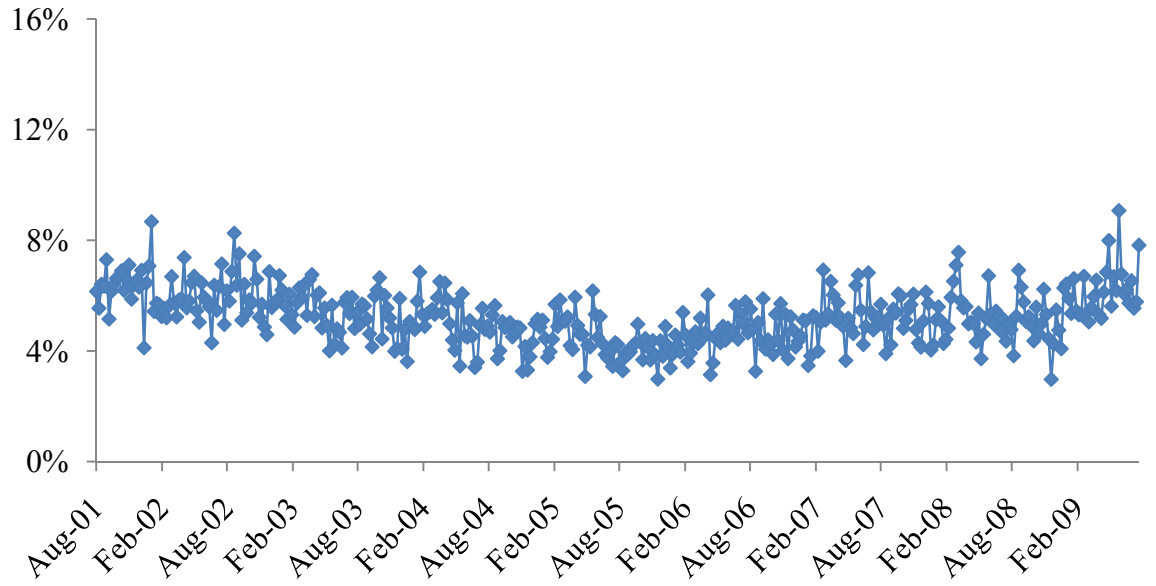


Exhibit 3.2.8 Percentage of Weekly Pork Total Loads Production Captured Through Voluntary Price Reporting, 2001 – October 2009[51]



[50] USDA, AMS data and LMIC; denominator is barrow and gilt production (carcass weight); and vertical axis is scaled to 30% to capture all data points.
[51] USDA, AMS data and LMIC; denominator is barrow and gilt production (carcass weight).

Exhibit 3.2.9 Coefficient of Variation in Daily AMS Wholesale Pork Load Volumes, 2001-October 2009[52]

Product	2001-2003	2004-2006	2007-2009
Loin, Bone-in, 1/4" Trim 21#/DN-LGT	0.70	0.92	0.90
Loin, Bone-in, 1/8" Trm/less 21#DN-LGT	0.84	1.28	0.96
Loin 1/4" Cntrcut, Bnls Strp-On, 10-11 Rib 5-11#	0.98	1.05	0.86
Loin 1/4" Cntrcut, Bnls Strp-Off, 10-11 Rib 5-11#	1.16	1.40	1.18
Loin, Bnls Sirloin .75-1.5#	0.84	1.15	0.91
Picnic, Bnls, Fresh 72% combo	0.86	1.60	2.11
Butt, 1/4" Trim 5-10#	0.69	0.91	0.80
Butt, 1/4" Trim Steak Ready 5-10#	1.01	3.13	2.77
Butt, 1/8" Trim Steak Ready 5-10#	0.92	1.71	1.24
Spareribs, 2/bag, 3 bags PCVAC 4.25/up#-MED	0.81	1.10	0.92
Ham, Bone-in, Trimmed 17-20#, Trim Spec 1	0.66	1.27	1.72
Ham, Bone-in, Trimmed 20-23#, Trim Spec 1	0.78	1.04	1.11
Ham, Bone-in, Trimmed 23-27#, Trim Spec 1	0.73	0.97	1.13
Ham, Bnls 94-96%, 4 Muscle Group	1.45	2.61	1.78
Ham, Bnls 94-96%, 5 Muscle Group	1.01	2.60	2.70
Belly, Sdls, Skin-on, Trimmed, 12-14#	0.81	2.13	1.40
Belly, Sdls, Skin-on, Trimmed, 14-16#	0.80	1.54	1.24
Belly, Sdls, Skin-on, Trimmed, 16-18#	0.83	1.55	1.99
Fresh 42% combo	0.70	1.23	1.35
Fresh 72% combo	0.76	0.99	1.11
Fresh, Skinned Jowls	0.88	5.10	6.01
Fresh Trim,Visual Trace of Lean, 12-16% combo	1.09	2.06	2.51

[52] USDA, AMS data; Constructed by Tonsor; and table reflects daily trade data through October 23, 2009.

Exhibit 3.2.10 Frequency of Days When AMS did not Report a Wholesale Pork Price, Selected Products, 2001- October 2009[53]

Product	2001-2003	2004-2006	2007-2009
Loin, Bone-in, 1/4" Trim 21#/DN-LGT	18%	26%	19%
Loin, Bone-in, 1/8" Trm/less 21#DN-LGT	47%	52%	28%
Loin 1/4" Cntrcut, Bnls Strp-On, 10-11 Rib 5-11#	28%	22%	11%
Loin 1/4" Cntrcut, Bnls Strp-Off, 10-11 Rib 5-11#	40%	35%	28%
Loin, Bnls Sirloin .75-1.5#	26%	36%	17%
Picnic, Bnls, Fresh 72% combo	50%	64%	77%
Butt, 1/4" Trim 5-10#	11%	17%	7%
Butt, 1/4" Trim Steak Ready 5-10#	66%	81%	79%
Butt, 1/8" Trim Steak Ready 5-10#	76%	68%	46%
Sparerib, 2/bag, 3 bags PCVAC 4.25/up#-MED	33%	33%	16%
Ham, Bone-in, Trimmed 17-20#, Trim Spec 1	28%	50%	67%
Ham, Bone-in, Trimmed 20-23#, Trim Spec 1	11%	26%	36%
Ham, Bone-in, Trimmed 23-27#, Trim Spec 1	11%	22%	23%
Ham, Bnls 94-96%, 4 Muscle Group	92%	78%	58%
Ham, Bnls 94-96%, 5 Muscle Group	81%	82%	74%
Belly, Sdls, Skin-on, Trimmed, 12-14#	56%	81%	58%
Belly, Sdls, Skin-on, Trimmed, 14-16#	39%	65%	47%
Belly, Sdls, Skin-on, Trimmed, 16-18#	54%	69%	73%
Fresh 42% combo	21%	41%	53%
Fresh 72% combo	10%	26%	33%
Fresh, Skinned Jowls	87%	96%	97%
Fresh Trim,Visual Trace of Lean, 12-16% combo	96%	77%	82%

Exhibit 3.2.11 Summary Statistics on Relative Contributions towards Total Load Counts, 2001-October 2009[54]

	Loin	Butt	Picnic	Rib	Ham	Belly	Trim
2001-2003	24.8%	14.5%	7.9%	3.0%	26.0%	7.8%	16.1%
2004-2006	33.1%	15.5%	8.3%	3.9%	22.0%	4.3%	13.1%
2007-2009	35.1%	17.6%	6.6%	6.5%	18.4%	5.4%	10.5%

Exhibit 3.2.12 Summary of Statistics on Relative Contributions towards Total Load Counts, 2001 – October 2009[55]

	Loin	Butt	Picnic	Rib	Ham	Belly	Trim
Average	30.8%	15.8%	7.6%	4.3%	22.3%	5.8%	13.4%
Std. Dev.	7.3%	4.7%	2.8%	2.7%	6.9%	3.5%	4.9%
Minimum	12.8%	5.1%	1.7%	0.0%	5.3%	0.0%	2.2%
Maximum	53.0%	37.8%	18.9%	16.3%	41.9%	20.5%	28.6%

[53] USDA, AMS data; Constructed by Tonsor; and table reflects daily trade data through October 23, 2009. Note: This table reflects AMS using subscripts to denote "old transactions" in the 2001-2005 period and blanks, or no reported values to denote days without current transactions during the 2006-2009 period.
[54] Constructed by Tonsor; and table reflects daily trade data through October 23, 2009.
[55] Constructed by Tonsor; and table reflects daily trade data through October 23, 2009.

Exhibit 3.2.13 Relative Contributions Towards Composite Cutout Value[56]

Loin	Butt	Picnic	Rib	Ham	Belly	Other*
25.3%	10.3%	11.1%	4.5%	25.0%	16.0%	7.7%

* Other includes Jowl, Hind Feet, Neck Bones, Tails, Front Feet, and Cut Loss

3.3 SUMMARY

The United States Department of Agriculture Agricultural Marketing Service (AMS) is responsible for public price reporting in the wholesale pork market. Currently, wholesale pork price reporting is completed by AMS market reporters who gather information about wholesale pork market trade to develop market news reports. The current procedures followed by AMS include multiple requirements and specific details defining what types of transactions in the wholesale pork market are eligible for reporting. This chapter has provided an overview of these requirements.

This chapter also discusses multiple data analyses conducted in assessing trends and possible issues with data resulting from the current AMS wholesale pork price reporting system. Since 2001, the analysis shows AMS reports are 1) capturing a declining share of total wholesale pork trade, 2) characterized by average load volumes represented in reports which are increasingly volatile, and 3) comprised disproportionally by larger volumes of retail products (e.g., loins, butts, and ribs) than processed products (e.g., hams & bellies) relative to their cutout value contributions. Each of these issues raises concerns regarding how representative current AMS market news reports are of actual wholesale pork market transactions.

[56] For more information see "USDA Estimated Composite Pork Carcass Cutout – An Overview." Available at: http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRD3484991.

CHAPTER 4: MANDATORY PRICE REPORTING

4.1 OVERVIEW OF MANDATORY PRICE REPORTING

One alternative to consider for wholesale pork price reporting is to adopt mandatory price reporting similar to what is done now with wholesale boxed beef. The Livestock Mandatory Reporting Act of 1999 mandated reporting of prices for live cattle, boxed beef, swine (barrows and gilts and sows and boars), and lamb by all qualifying packers for each transaction. The Act did not include mandatory reporting for wholesale pork. Mandatory price reporting was enacted by AMS on April 2, 2001. For swine, qualifying packers included those slaughter plants that processed on average at least 100,000 head annually during the preceding five calendar years.

September 30, 2005 the statutory authority of the 1999 Act expired. In October of 2006 the 1999 Act was reauthorized until September 30, 2010. In the October 2006 reauthorization, which had its final rule published in the May 16, 2008 *Federal Register*, modifications were made to swine purchase reporting. Under the Reauthorization Act, swine processors required to report hog purchases were amended to also include, in addition to the previously noted 100,000 head clause, any packing firm that slaughtered at least 200,000 sows and/or boars on average during the preceding five years. This clause added packers to reporting requirements that had several plants too small to fit under the 100,000 clause, but collectively represented at least 200,000 sows and boar slaughter.

Mandatory price reporting for wholesale pork could take on a variety of forms, but if adopted, things learned from current mandatory price reporting systems are certainly valuable. This chapter summarizes aspects of mandatory price reporting and provides information relevant for consideration of a mandatory price reporting system in pork wholesale markets. However, the most valuable outcome of this research project was a clear message that simply mandating wholesale pork price reporting is unlikely to address many of the most important limitations and concerns with current wholesale pork price reporting. The main point here is that mandatory wholesale pork pricing needs to be considered within a much broader framework of overall challenges and needs for enhanced wholesale pork price reporting. Chapter 5 contains specific discussion of these additional considerations.

4.2. REVIEW OF SELECTED MANDATORY PRICE REPORTING LITERATURE

The economics literature contains many articles discussing issues of price discovery and determination, assessing the value of public information to market participants, and examining impacts of mandatory price reporting systems in commodity markets. This short literature review highlights this work to a) provide context for the general discussion of price discovery and information value in the wholesale pork market and b) note the range of potential impacts mandating wholesale pork price reporting could have.

Price Discovery vs. Price Determination

Any discussion involving the accuracy or representativeness of commodity price markets must contain a clear distinction between *price discovery* and *price determination* (Tomek and Robinson, 2003). Price levels are determined by the interaction of market demand and supply. Accordingly, as market demand and supply change, equilibrium prices adjust. Conversely, price discovery reflects the span of individual transactions that occur in a market.

Price discovery is inherently imprecise because neither buying nor selling parties ever have complete and precise information on all factors influencing demand and supply. This imprecision can develop as a result of no access to this information as well as the fact that collecting such information is costly. Schroeder and Mintert (1999) depict this by explaining how imperfect information leads to a range of individual transaction prices occurring around the market prevailing price. Stated differently, supply and demand factors determine market price and incomplete information leads individual transactions in a market to deviate from the market price. As uncertainty increases among market participants regarding actual supply and demand characteristics, the deviations between individual transaction prices and market prices will increase. Accordingly, the extent of these deviations can be evaluated to assess the effectiveness of price discovery in a given market (Devine and Marion, 1979; Stigler, 1961).

In the context of evaluating wholesale pork price reporting systems, this difference between price discovery and determination must also be noted. In particular, the role of a public price reporting system is first and foremost to aid price discovery. As noted above, this differs from improving the price determination process to aid one party or another. This clarification must be cleanly made in any discussion assessing the current AMS system or any future system of wholesale pork price reporting.

Value of Public Market Information

Easily accessible and accurate market information can serve two functions (Perry et al., 2005). Market information may speed up the process for identifying prices equating demand and supply, as better information about prices paid in similar transactions leads to faster convergence of market-clearing prices. Moreover, accurate, reliable market information reduces risk and pricing errors, or pricing inaccuracy. Secondly, easily accessible and accurate market price information provides important market signals, such as value differences, regional price differences, and quantities available to buyers and sellers, which guide subsequent production decisions, giving producers incentives to produce what buyers want.

The ability of any market to function efficiently with respect to pricing depends in large part on the information available to market participants. Grossman and Stiglitz (1980) note that prices cannot perfectly reflect all available information, since search costs of obtaining information are costly. Furthermore, an increase in the quality of information or a reduction

in the cost of obtaining this information will increase the informational content of prices and hence their value to market participants.

Devine and Marion (1979) found that disseminating accurate retail price information reduced price dispersion among items at competing grocery stores and reduced the average price level in the market. Irwin (1996) found public situation and outlook information leads to increased social welfare by increasing the speed of convergence to equilibrium.

As noted by Carter and Galopin (1993), in agricultural markets, government reports traditionally have been the main source of market information. While market alternatives to government reporting exist, these alternatives may not have the same informational content as government reports. Moreover, there is evidence that government reports impact hog markets. For instance, Colling, Irwin, and Zulauf (1997) found that nearby pork belly and live hog futures prices responded significantly to the U.S. Department of Agriculture's "Cold Storage Report." Colling and Irwin (1990) note that USDA's "Hogs and Pigs Reports" impact live hog futures market.

Mandatory Price Reporting

The preceding paragraphs highlight multiple articles suggesting the value of publically available information to agricultural markets. It is hardly surprising then that as marketing practices in U.S. livestock markets have evolved increasingly away from spot, cash market transactions that some market participants have suggested mandating collection and release of price transaction data. This desire ultimately resulted in the Livestock Mandatory Reporting (LMR) Act of 1999, which requires major meatpackers to report all transactions covering hog, cattle, and lamb purchases and commitments to the USDA. In research preceding and following this Act, the broader effects of mandatory price reporting (MPR) have been evaluated, including issues such as possible market power impacts (Njoroge et al., 2007), livestock producer perceptions (e.g., Grunewald, Schroeder, and Ward, 2004), impacts on live cattle market integration (e.g., Pendell and Schroeder, 2006), and basic benefits that MPR may provide.

One frequently made assertion is that under voluntary reporting systems, market participants may be selective in what and when they report. This issue was investigated by Koontz (1999) in a comparison of cattle feeding closeout information and voluntarily reported AMS prices between 1986 and 1993. Results indicate that selective reporting characterized the examined market. Koontz notes that this may be used to support arguments for mandatory price reporting but warns of several issues with implementing a mandatory system.

Another notion in discussions comparing voluntary and mandatory price systems is the representativeness of prices captured in a voluntary system. Two analyses have examined this issue by evaluating how different levels of information provision impact variance of prices. In an experiment utilizing Oklahoma State University's Fed Cattle Market Simulator, Anderson et al. (1998) found that reducing information available to market participants increased price variance and decreased market efficiency. This suggests that by providing additional information, possibly through imposing MPR, the variance of market prices may

be reduced and hence market efficiency enhanced. Conversely, in another experimental study, Nelson and Turner (1995) found no impacts on price variance when market participants were provided with less information. Anderson et al. (1998) carefully note that looking only at price-level impacts, it is impossible to determine which sector of an industry stands to gain or lose the most from changes in available market information. Accordingly, the authors suggest rather than focusing on who stands to gain or lose from reduced public information, the impacts on price variance should be focused on, as this influences the competitiveness of an entire industry.

Grunewald, Schroeder, and Ward (2004) provide the only known evaluation of livestock producer sentiments regarding mandatory price reporting. In particular, they surveyed cattle feeders to assess their opinions regarding MPR. Producers were largely disappointed with what MPR accomplished. The authors attribute this finding to likely unrealistic expectations of cattle feeders. In the context of wholesale pork price reporting, this study would suggest that pork producers supporting a switch from voluntary to mandatory price reporting of pork transactions may too be disappointed.

Another obvious question to assess is what the impacts are in situations where mandatory price reporting has been adopted. Njoroge et al. (2007) assessed the social welfare impacts of MPR taking account of market structure impacts. They conclude that even if additional information provided by MPR leads to market collusion, it can still enhance overall social welfare. This is consistent with the Anderson et al. (1998) that reducing price variance in a market can increase the competiveness of an entire industry and yet have different impacts on individual industry segments. Devine and Marion (1979) found that increasing market information resulted in market shares of grocery stores altering such that the four-firm concentration ratio increased. The authors accordingly note that over the longer term similar change in market structure may be more important than immediate impacts on price discovery under the current market structure.

Two studies have directly examined impacts of MPR in U.S. livestock markets. Pendell and Schroeder (2006) evaluated the impact of MPR on five regional fed cattle markets. MPR increased integration of these markets, though markets were integrated prior to MPR. That is, following enactment of MPR, fed cattle markets prices moved more closely together. The authors provide a couple possible explanations for this finding. The information content of price information or the associated trust of market participants may have improved with MPR. This is consistent with the notion of Tomek (1980) that the amount or quality of information in a public report may not be equal for all transactions (or sources). In an analysis of the U.S. lamb market, Marsh and McDonnell (2006) found the switch to MPR in lamb markets to have reduced lamb carcass price risk. Future work evaluating the impacts on wholesale beef market integration before and after the imposition of MRP would be particularly informative in this analysis of wholesale pork price reporting; unfortunately we are unaware of a published analysis that is available at this time.

4.3 WELFARE ASSESSMENT

Welfare Effects of price reporting have been previously examined (see Albaek, Mollgaard, and Overagaard, 1997 and Spence, 1978) and applied to the livestock industry by Njoroge, Yiannaka, Giannakas, and Azzam, 2007 (denoted by NYGA (2007) from here forward), with application to the beef industry in relation to livestock mandatory price reporting. NYGA (2007) pointed to the fact that while there is a risk reduction mechanism attached to increasing market liquidity, there is also a collusive opportunity. The risk reduction component relates to the reduction in uncertainty from access to more information. Anderson et al. (1998) and Bastian, Koontz, and Menkhaus (2001) each showed, through simulated trading, the reduction in price variance with the provision of greater information.[57]

Njoroge (2003) noted that prior to implementation of mandatory price reporting, packers have divergent priors with respect to meat prices. Whereas after implementation of mandatory price reporting, packers may have convergent posteriors with respect to updating their prior after factoring in the publicly available information. Njorge argued that it is easier for firms to monitor each other's deviations from a (indirect) collusive agreement.[58] Azam and Salvador (2004) expressed the same concern with mandatory livestock price reporting.

NYGA (2007) analyzed the mixed welfare effects with both the risk effect dominating the collusive effect and vice versa. They concluded that even in the presence of collusive behavior the net welfare effects are positive, i.e., the positive benefits of risk reduction outweigh any negative effects from collusive behavior.

For convenience only, the situation of the risk effect dominating the collusive effect is shown as Exhibit 4.3.1 Figures (A) and (B), which shows the derivation of total economic surplus. Figure (A) shows consumer surplus, producer surplus, and hog processor profits. Figure (B) captures the collusive behavior effect and total economic surplus. Figures (A) and (B) capture increased price transparency, change in hog procurement levels (Q), change in livestock price (W), and change in consumer price (P). Variable C_u represents the cost of uncertainty. ME and AE represent the marginal and average expenditures by the packer, inclusive of uncertainty. Note, S_L is the supply of livestock.

Increased price transparency leads to a clockwise movement of both the ME and AE curves (to ME'' and AE'). Note that ME'' in Figure (A) is leftward of ME' in Figure (B) because of the collusive effect. In summary, the number of animals procured increases (Q to Q'), consumer prices drop (P to P'), and packer costs for procuring livestock drop (W + C_u to W +

[57] Armstrong (1985), Armstrong and Brodie (1999), and Armstrong, Brodie, and McIntryre (1987) report on the firm level value of an increase in price validity, i.e, through an increase in forecasting accuracy. Armstrong (1985) noted that increased forecasting accuracy allows for better decision making related to strategic planning, plant operations, and a reduction in transaction costs (i.e., easier to arrive at decisions).

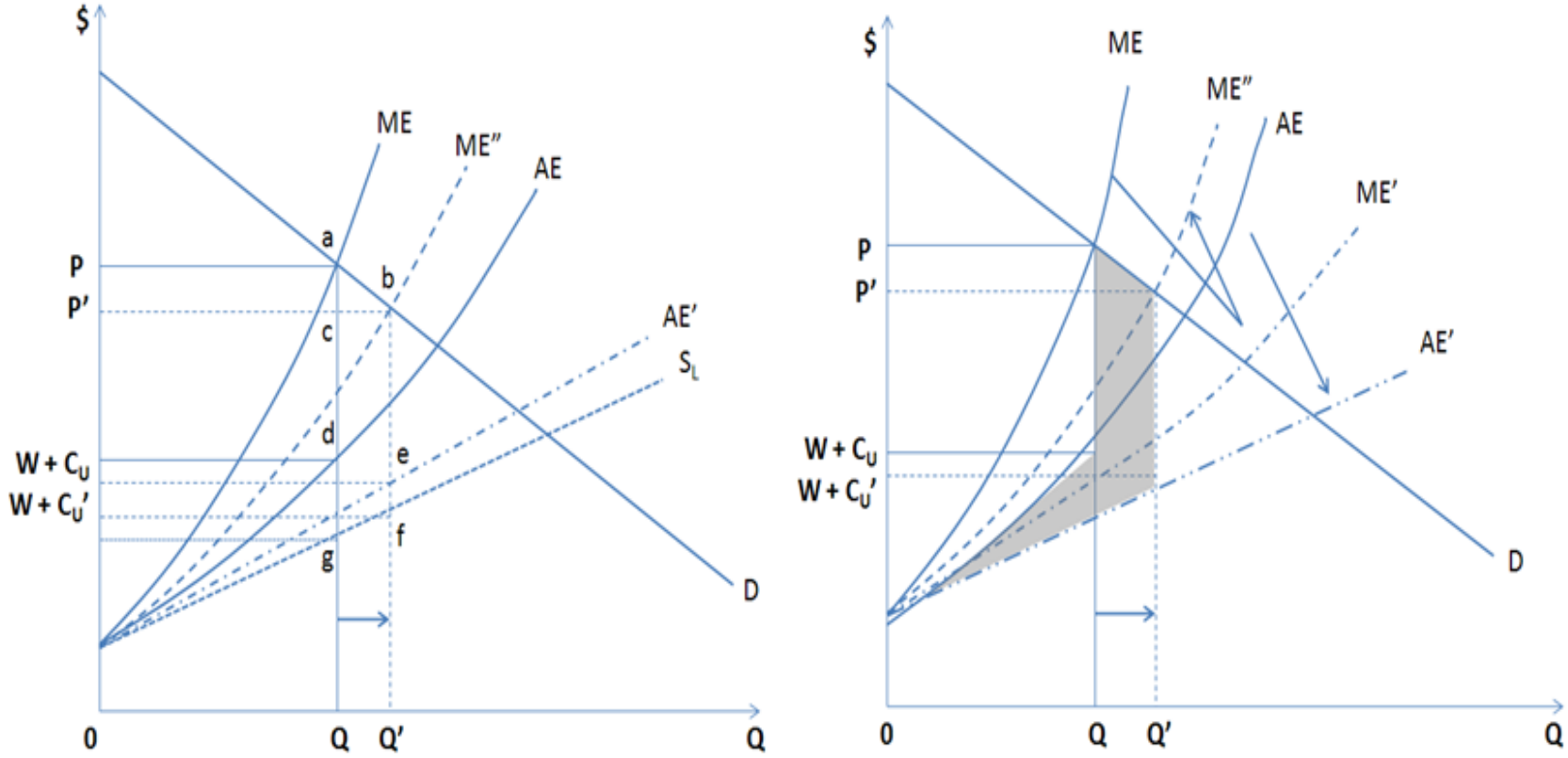
[58] Njoroge (2003) used the term 'tacitly' to explain this collusive agreement. In simplified terms this refers to the ability for each firm to monitor the other's price movement by observing the publically available information (in aggregate). Thus, in theory a firm would not want to be the first to adjust prices (based on their internal projections) until the market is observed to move, i.e., no one firm wishes to set a non-advantageous market price.

C_u'). Total economic surplus is denoted by the grey shaded area in Figure (B). The grey area indicates a positive net gain to society through mandatory price reporting. From Figure (A) a producer surplus increase is represented by the area W'fgW, a consumer surplus increase is represented by the area PabP', and a increase in packer profits is represented by cbe(W+ C_u')(W+ C_u)d-PacP'.

4.4 SUMMARY

This chapter summarizes aspects of mandatory price reporting and provides information relevant for consideration of a mandatory price reporting system in pork wholesale markets. The take-home point of this chapter is that mandatory wholesale pork pricing needs to be considered as a potential component of a larger framework of strategies and options for improving wholesale pork price reporting. That is, ceteris paribus, simply mandating wholesale pork price reporting is unlikely to address many of the most important limitations and concerns with current wholesale pork price reporting. Accordingly, Chapter 5 picks this issue up and discusses these possible adjustments.

Exhibit 4.3.1 Graphical Depiction of Economic Surplus and Welfare Benefits from Adoption of Mandatory Price Reporting Accounting for Increased Price Transparency and Potential for Packer Collusive Behavior (recreated from Njoroge et al. 2007)



(A) (B)

CHAPTER 5: ASSESSMENT OF REPORTING PROCEDURES

As noted in 1.3., we utilized a series of phone interviews, face-to-face discussions, and industry written surveys to collect a comprehensive set of insights and suggestions from entities largely comprising the hog-pork industry. The findings of this exercise regarding industry sentiment involving the current wholesale pork price reporting system and possible methods for improving the system are highlighted in 5.1 and 5.2, respectively, and summarized in Exhibit 5.2.6.

5.1 INDUSTRY PERSPECTIVES - CURRENT WHOLESALE PORK PRICE REPORTING

Perhaps the most common sentiment of industry stakeholders we conversed with is that the current wholesale pork price reporting system is not representative of overall supply and demand conditions in the marketplace. For instance, when asked about current USDA market news pork price reporting, 82%, 80%, and 70% of pork buyer survey respondents disagreed that daily individual cut prices, daily primal prices, and daily cutout prices are representative of trade, respectively (Exhibit 5.2.1).[59] This discontent with current price reporting is associated with several wholesale pork market characteristics routinely noted as challenges in any attempt at price reporting:

- Heavy dependence on formula priced transactions based upon a diminishing negotiated market,
- Ever increasing heterogeneity in products including specifications, enhancements, and case ready attributes,
- High frequency of intra-company transfers, packer-to-packer transfer and other transactions not considered "negotiated cash" trades,
- The timing of industry pork trade has changed over time with an increasing share occurring at points more than two weeks into the future,
- Changing prominence of export market importance in pork trade

The net effect of changing pork market characteristics is that a low proportion of pork trade is even eligible for AMS reporting. Surveyed pork buyers indicated that less than one-fourth of their purchases are negotiated cash trades for delivery 0-10 days forward (Exhibit 5.2.5).[60]

As noted in 4.2, a drawback of voluntary price reporting systems is the possibility of selective reporting. In our discussions, many industry representatives voiced concerns about selective reporting in current wholesale pork price reporting. For instance, several discussions revealed a perception that if an entity has 10 transactions that may meet current AMS qualifications to be included in their market news reports, only eight would actually be reported to AMS. These eight transactions may be actual transactions and be reported accurately, but the fact that not all 10 transactions are reported may be problematic. This

[59] Only 30% of survey respondents, about one-half of those interviewed through phone conference calls, indicated instances where their firm confirmed trades with USDA. Note, those responding to the survey or interviewed answered questions to the best of their knowledge. Others within their firm may have been involved with confirming trades.

[60] See Lawrence et al. (2007) transaction details they found.

concern is further exacerbated by the industry's heavy use of top-side pricing in formula pork trade that makes it more sensitive to partial reporting than an industry solely utilizing weighted-average based formulas. While these concerns with selective reporting are important, one must also carefully note several industry participants expressed views that rather than selective reporting being the core issue, the critical issue driving low reported trade volumes is that pork trades routinely do not fit AMS reporting eligibility requirements.

The industry also revealed concern with how AMS currently calculates published prices. In particular, several examples were shared suggesting that on a given day both bone-in and boneless ham reported prices may increase, but the reported ham cutout value could decrease. While this seems counterintuitive, this may be possible in cases of large changes in relative reported load volumes between bone-in and boneless hams that collectively influence a volume weighted average ham primal calculation.

Given noted concerns, a relevant question to ask is if current AMS wholesale pork price reports are being utilized? Overwhelmingly, industry representatives indicated routinely using AMS pork market news reports. Evidence of this is summarized in Exhibit 5.1.2 showing over 70% of pork buyer survey respondents indicated regular use of daily cutout, primal, and individual cut values. Many industry participants noted substantial use of AMS prices on particular pork cuts as a base in formula trades comprising a larger portion of total pork trade. However, in each discussion of formula trades based upon AMS prices, industry indicated that when a particular price is not reported (indicating AMS did not have a current day, reportable transaction), the most recently reported price is used in the transaction. Moreover, this was noted as a common event and for such formula derived prices to remain static because a more recent price has not been reported from AMS.

Additional value and use of AMS prices was noted as some pork industry members utilize AMS prices to set internal prices within their company. While this reiterates the importance of AMS prices to industry, it also notes the caution necessary in any consideration of including inter-firm transactions in AMS price reporting systems. Moreover, the pork industry uses AMS price reports to gauge their firm's performance. For instance it was noted as a common practice to have performance of individual staff (management and sales personnel) compared to market news released by AMS.

Use of AMS prices was also emphasized when discussing industry practices of smaller market participants. In particular, some smaller industry players utilize AMS price reports because they lack the internal data analysis capabilities of larger entities. Similarly, a couple phone interviews indicated smaller hog packers and pork buyers are more likely to negotiate directly from AMS price reports as they lack the necessary trade volume to negotiate through other channels. Combined, these points suggests that the relative value of AMS price information on a per head basis is likely larger for smaller hog packers and pork buyers.

5.2 INDUSTRY PERSPECTIVES - POSSIBLE IMPROVEMENTS TO WHOLESALE PORK PRICE REPORTING

Given the discussion in 5.1, it is hardly surprising that nearly all dialogue with industry included suggestions for improving pork price reporting. Among these suggestions, those with the most frequently noted support include:

- Add pork destined for Canada or Mexico,
- Extend the window by about one more week for product included the negotiated time window,
- Add pumped and other enhanced products for which acceptable conversions can be made by AMS

Similarly, there was a general consensus that the following exclusions from future pork price reporting should remain in place:

- Export pork destined for countries besides Canada and Mexico,
- Case-ready products,
- All inter- or intra-firm transactions,

The issue of including export destined pork in AMS pork price reporting system generated a range of comments from industry. Some of the industry's large volume players indicated that up to 30% of their products are export destined and that capturing that volume should be considered by AMS. In particular, there was more support than contention with the notion of including pork destined for Canada or Mexico into AMS reports (Exhibit 5.2.1). In general, industry indicated that these transactions are similar to those occurring in domestic markets and their inclusion would be valid. Conversely, there was hesitation against including pork destined for non-North American markets in domestic prices reports as product specifications, shipping transaction costs, international trade disputes, etc. are larger issues with these markets.

Exhibit 5.2.3 indicates when asked about the most appropriate time window to consider as the “negotiated cash” market, pork buyer survey respondents most frequently indicate 0-21 days forward as the preferred window width. In fact, for each primal, 20% or less respondents most frequently indicate 0-7 or 0-10 days forward as the preferred window width. More generally, our discussions with industry suggested a general desire to increase the window to either a 0-17 day or 0-21 day width.

Given the recent experience of the beef industry in switching from voluntary to mandatory price reporting and the fact many pork industry players are also participants in the beef industry, each discussion of improving wholesale pork price reporting includes comments on the possible implementation of a mandatory system. It is important to note that in most of these discussions, industry sentiment was that most practical and valuable adjustments could be made to improve price reporting in either a mandatory price reporting system or an adjusted system that remains voluntary. This is a critical point highlighting one of this study’s main findings: simply mandating pork price reporting will not likely remedy issues with the current price reporting system. Rather adjustments in what is included and eligible for price reporting must be carefully considered and implemented. That is, simply mandating

a price reporting system will not change core market characteristics or definitions of eligible transactions. For instance, under the current price reporting system package deals, where one product is a loss leader under agreement of premiums on other products, are not captured. However, simply mandating price reporting would not address this issue without specific attention to "unbundling" such transactions.

While most industry participants do not believe simply mandating the current price reporting system will resolve the concerns, we also fielded multiple comments such as "mandatory price reporting worked for beef price discovery, why not for pork?" and "nothing else has worked, why not try mandatory?" Moreover, when asked about mandating pork price reporting, 90%, and 80% of pork buyer survey respondents supported mandatory pork price reporting for packers that already are mandated to report barrow and gilt prices and sow prices, respectively (Exhibit 5.2.1). Accordingly, while the industry generally does not think a mandatory system without additional adjustments in procedures is sufficient, there is support particularly from pork buyers to implement a mandatory system.

It was noted that a switch to mandatory price reporting has the potential of providing larger packers and meat buyers with relatively more information as they possess an advantage in their capacity to analyze resulting data. This is noteworthy as a commonly stated argument of those in favor of mandating pork price reporting is to improve information for hog producers. However, if packers and meat buyers possess an advantage in data analytic abilities, even without exerting any potential market power, the possible provision of additional information to the pork industry may enhance the welfare of non-producers more than producers.

Industry interviews also suggest pork packers with experience in the beef packing sector will likely have an advantage in implementing a possible mandatory price reporting system. The intellectual learning curve associated with beef will be invaluable in the pork industry and the marginal costs of "data dumps" are likely lower due to prior investments.

A concern with implementing a mandatory wholesale pork price reporting system is the impact a 3/70/20 confidentiality clause, similar to that characterizing mandatory beef price reporting, would have on the frequency of eligible transactions for reporting. Most industry personnel suggested that the exact impacts (i.e. exclusion of select products from AMS reporting) cannot be assessed until full "data dumps" of all eligible industry transactions are made and a thorough data analysis is conducted. However, most discussions indicated that the frequency of 3/70/20 being binding would be likely low and that the "net gain" of volume in a mandatory price reporting system would probably be positive. In the event confidentiality clauses routinely prohibited reporting on some products, the industry was generally supportive of using a multi-day rolling average (similar to lamb reporting).

Currently, for voluntary price reporting, AMS reports wholesale pork prices on an FOB-Omaha basis. That is, AMS adjusts reported FOB packing plant prices for transportation to standardize prices from nationally-dispersed transactions to reflect a common location. This practice differs from that of mandatory beef price reporting where FOB packing plant prices are reported. This difference is noteworthy as the beef industry has packing plants largely

residing in a common geographic region while the pork industry has packing plants both in the Midwest and Eastern Seaboard, where location differences are highly associated with ownership differences (see Exhibit 2.3.1.2). Accordingly, an FOB plant approach in wholesale pork price reporting may unintentionally reveal more specific information about a particular entity. This is one of a few examples where simply "implementing procedures similar to beef mandatory price reporting" warrants careful thought.

Pork industry representatives expressed some concern with the transportation discrepancy between pork packers, relative to Eastern Seaboard Markets. But in general, industry representatives supported wholesale pork price reporting using an FOB packing plant basis rather than the currently used FOB Omaha basis.

Exhibit 5.2.1 Summary of Survey Pork Buyer Perceptions and Preferences[61]

	Agree	Neutral	Disagree
Daily individual cut prices are representative of trade	9%	9%	82%
Daily primal prices are representative of trade	20%	0%	80%
Daily cutout prices are representative of trade	30%	0%	70%
Trade volume represented in pork price reports is adequate	0%	10%	90%
We favor continued voluntary as opposed to mandatory pork price reporting	0%	0%	100%
We favor mandatory pork price reporting for packers that already are mandated to report barrow and gilt prices	90%	10%	0%
We favor mandatory pork price reporting for packers that already are mandated to report sow prices	80%	10%	10%
Canada and Mexico pork export prices should be incorporated into pork price reports	70%	10%	20%
Rest of World (other than Canada and Mexico) pork export prices should be incorporated into pork price reports	50%	20%	30%
Value-added pork products should be incorporated into pork price reports	60%	30%	10%
There is value in having access to domestic transaction volume information, even without any price information	33%	22%	44%
There is value in having access to export transaction volume information, even without any price information	44%	44%	11%
USDA should reduce truck load volume requirements for pork price reporting	10%	60%	30%
USDA should increase truck load volume requirements for pork price reporting	10%	50%	40%
USDA should report formula price transactions	56%	11%	33%
USDA should report sow meat negotiated cash transactions	70%	10%	20%

[61] Number of observations is equal to eleven. However, the number of observations must be considered relative to the population and size of the industry. We will not provide an estimate of the % of pork purchases represented by survey respondents due to confidentiality.

Exhibit 5.2.2 USDA Market News Pork Price Reported Values do you Regularly Use? (Percent Indicated Yes) [62]

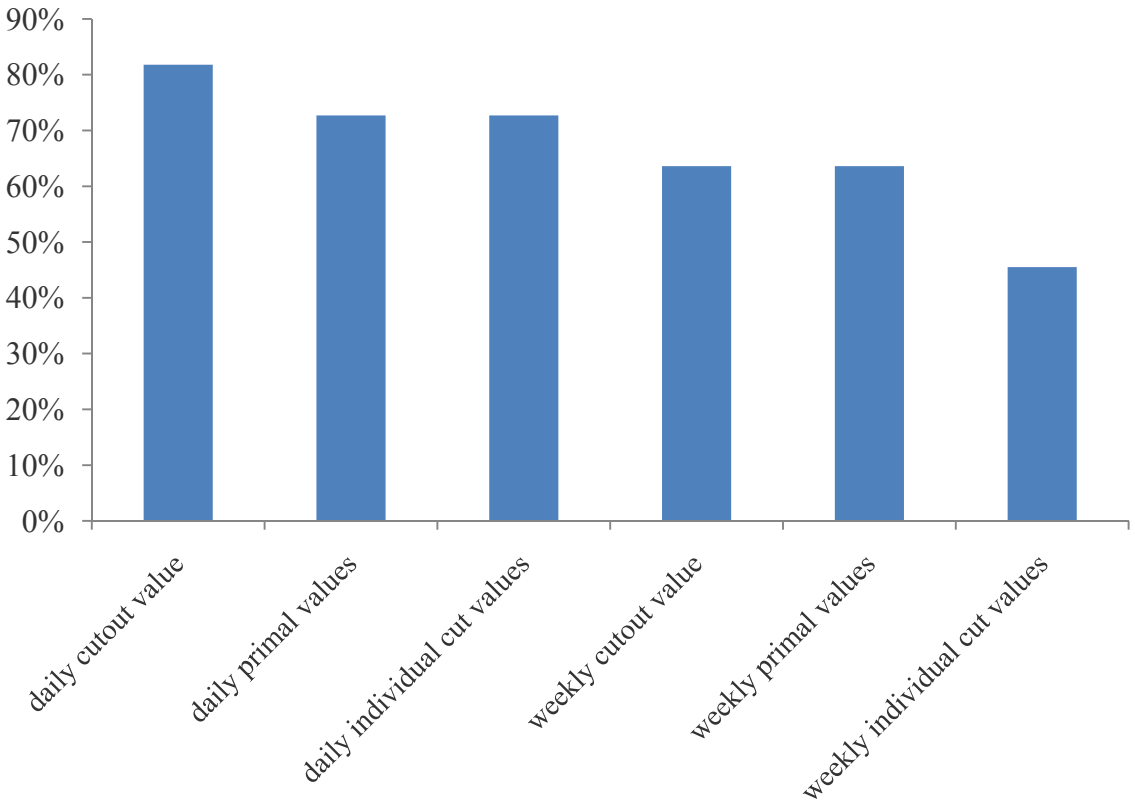


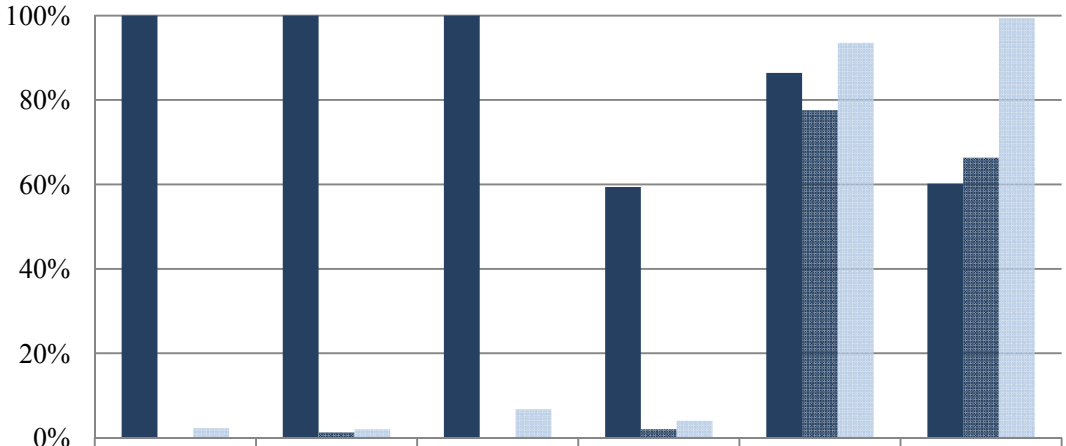
Exhibit 5.2.3 For the Following Primal, or Cuts from that Primal, What is the Most Appropriate Time Window to Consider as the "Negotiated Cash" Market? [63]

	0-7 days forward	0-10 days forward	0-14 days forward	0-21 days forward	0-28 days forward
Loin	10%	10%	20%	60%	0%
Butt	10%	10%	20%	60%	0%
Picnic	10%	10%	20%	60%	0%
Rib	10%	10%	20%	50%	10%
Ham	10%	10%	20%	40%	20%
Bellies	10%	0%	20%	50%	20%

[62] Number of observations is equal to eleven. However, the number of observations must be considered relative to the population and size of the industry. We will not provide an estimate of the % of pork purchases represented by survey respondents due to confidentiality.

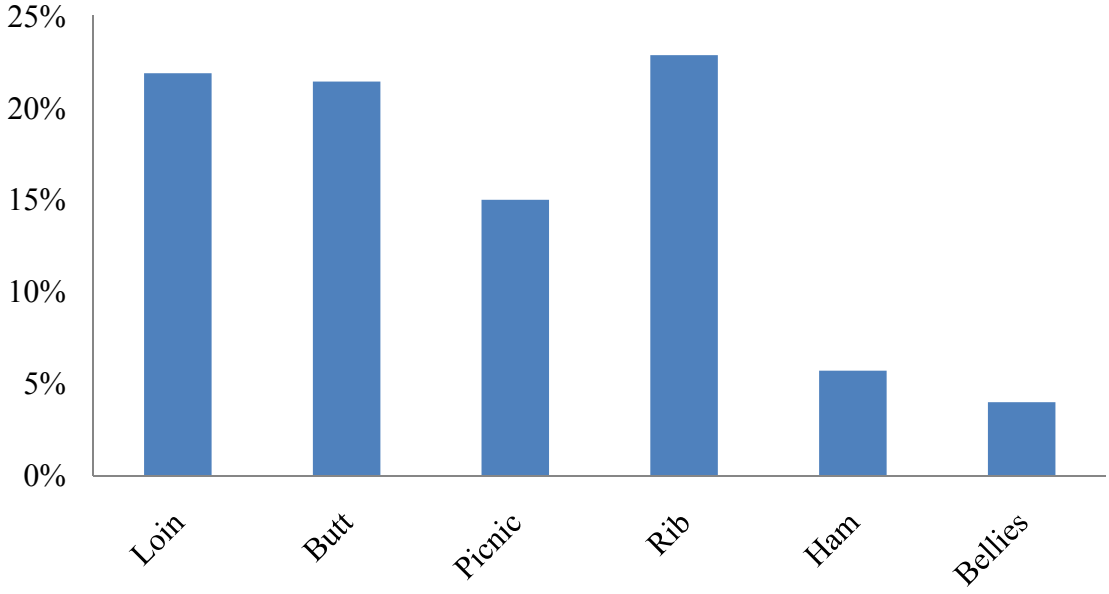
[63] Number of observations is equal to eleven. However, the number of observations must be considered relative to the population and size of the industry. We will not provide an estimate of the % of pork purchases represented by survey respondents due to confidentiality.

Exhibit 5.2.4 For the Following Primal, or Cuts from that Primal, What Percentage of Your Operations' Purchases are Typically Value Added or Enhanced? [64][65]



	Loin	Butt	Picnic	Rib	Ham	Bellies
Fresh	100%	100%	100%	59%	86%	60%
Pre-cooked	0.00%	1.25%	0.00%	2.00%	77.60%	66.33%
Cured or smoked	2%	2%	7%	4%	94%	99%

Exhibit 5.2.5 For the Following Primal, or Cuts from that Primal, What Percentage of Your Operations' Purchases are Priced Using the Negotiated Cash Market?



[64] Number of observations is equal to eleven. However, the number of observations must be considered relative to the population and size of the industry. We will not provide an estimate of the % of pork purchases represented by survey respondents due to confidentiality.

[65] Percentage computed as percentage of respondents. A question was also asked relative to pre-cooked. Respondents only answered for Ham and Belly, most respondents answered similarly between pre-cooked and cured/smoked. Thus, the pre-cooked category was dropped.

Exhibit 5.2.6 Summary of Industry Sentiment Related to Mandatory Pork Price Reporting

Topic	Summary
General feeling	Pork Buyers - Supportive / Pork Packers - Willing
Confidentiality requirement	Likely not an issue; multi-day rolling average would be acceptable
Intra- and Inter-company transfers	Exclude from reports
Price location (FOB plant)	FOB Plant is fine, be consistent with beef MPR
Delivery period for negotiated prices	Extend period to 0-17 or 0-21 days
Forward pricing	Capture, report separately up to 90 days out
Enhanced/pumped/value added	Capture, if there is transparency of conversions
Destination (export)	Include North America, exclude everything else
Volume requirements	Keep current load minimums

5.3 INCREASING PRICE REPORTING FREQUENCY

This section is provided to list various methods for analyzing liquidity issues and potential steps for increasing liquidity. The alternatives range from "what-if" of capturing adequate trade volume, implications related to altering price reporting specifications, and methodologies for capturing additional trade through product conversion, e.g., hedonic modeling.

5.3.1 ANALYZING MARKET LIQUIDITY

The concept of market price transparency has been tied to the quantity of trades that are used to derive market price, or price range, for a given market. The use of the term "thin market" is used to describe markets for which reliability of a supply and demand determined price is questioned due to an insufficient number of transactions. (Hayenga et al., 1979, Tomek, 1980, and Nelson and Turner, 1995).

The concern over a thin market is limited to a market trade where there is concern that the quantity of reported market transactions is sufficiently small relative to the broader regional or national market size, such that the reported market price is not reflective of general market price levels or price changes.

Tomek (1980) suggested the use of a common statistical measure, Chebychev's inequality, as a non-stochastic measure of reliability of an existing price series. Chebychev's inequality allows for the calculation of a desired number of observations to obtain a given level of expected price reliability. This computed number of observations, which represents the expected number of observations from Chebychev's inequality, can then be compared to the actual quantity of trade reported to assess the sufficiency, or insufficiency, of the transactions currently deriving reported AMS market prices.

As Chebychev's inequality is a basic statistical measure, from which countless other statistical tests are derived, the simplicity yet power of Chebychev's inequality is appealing.[66] Chebychev's inequality is the statistical measure used to arrive at the reliability of an estimate. For example, the margin of error reported for presidential approval ratings may be based on Chebychev's inequality. Chebychev's inequality allows for the computation of the probability of an event occurring, given an acceptable margin of error and variability in the desired data. The inequality can be re-arranged to arrive at the desired margin of error or optimal number of observations.

For the current analysis the desire lies with determining the number of observations necessary to yield a certain level of confidence with reported price data. A couple of assumptions must be made. First, the probability of the price series reliability must be set. Second, the size of the margin of error must be established. Price variability is derived from historical data.

In this study, a Chebychev's inequality analysis was applied to each primal cut, wholesale pork cutout, and the live hog price using data on week-to-week price changes and associated load volumes. Therefore, the margin of error factor refers to the acceptable level of week-to-week price changes. Arbitrarily, the probability of reliability was set at 90%. Steps taken in the analysis include (see Exhibit 5.3.2):

1) The average weekly load count was computed for each year.
2) The variation in week-to-week AMS reported prices was computed for each year.
3) The probability of reliance was set at 90%.
4) The value of the desired margin of error was set to four separate levels ($0.25, $0.50, $0.75, and $1 per pound) for each primal and four separate levels ($0.05, $0.10, $0.25, and $0.50 per pound) for the wholesale cutout and live hog price.[67]

[66] Chebeychev's inequality can be expressed as: $P(-c \leq x_n \ - M \leq c) \geq 1 - \frac{\sigma^2}{nc^2}$, where P is probability operator, X and M represents the mean and deviation from the mean, c represents the desired margin of error, σ^2 is the variance of the data series, and n is the number of observations. Rearranging Chebychev's inequality, the approximate optimal number of observations $n \approx \frac{\sigma_n^2}{(1-P)c^2}$ for a given probability (P), known variance (σ^2) and desired margin of error (c).

[58] The live hog price was included in the analysis to provide an approximation of difference between prices collected through mandatory price reporting versus primal and wholesale cut prices collected through voluntary price reporting.

Observations from analysis using Chebychev's inequality:

a) Week-to-week price variation has increased over time for each pork primal price series
- Loin: Price variation inconsistency is partially offset by the relative large load count
- Butt: The inconsistency of the price variation is unknown, but troublesome
- Picnic: Price variation has held relatively constant over time
- Rib: Significant price variation reflects product heterogeneity and small trade
- Ham: Price variation has increased 3x over the past eight years
- Bellies: Significant price variation reflects product heterogeneity and small trade

b) Average weekly load counts vary by pork primal

c) For the live hog price series, considerable reliability persists in the price data over time
- Avg. weekly head count is approximately 3.5 to 4x that required

d) For the pork carcass cutout, an additional 4x the current average weekly load count would decrease the margin of error by over 50%, for a desired predictability level of 90%
- The pork cutout represents approximately 5% to 6% of total cutout trade

e) For primal trade, considerable additional trade must be captured to add significant reliability
- Loin: 2x to 3x current load count is needed to add sufficient reliability
- Butt: 4x to 5x current load count is needed to add sufficient reliability
- Picnic: 8x to 10x current load count is needed to add sufficient reliability
- Rib: 15x to 18x current load count is needed to add sufficient reliability
- Ham: 5x to 7x current load count is needed to add sufficient reliability
- Bellies: 20x to 24x current load count is needed to add sufficient reliability

Exhibit 5.3.1.1 Summary of Statistically Inferred Load Counts Based on Chosen Level of Accuracy

Primal	Average Weekly Load Count	Average Variance of Week-to-Week Price Difference	Estimated Loads from Chebychev's (P = 0.90, c = stated value)			
			$0.25	$0.50	$0.75	$1.00
Loin						
2001	95	$12.56	2,010	502	223	126
2002	100	$8.88	1,420	355	158	89
2003	100	$19.09	3,054	763	339	191
2004	112	$20.30	3,248	812	361	203
2005	104	$10.88	1,741	435	193	109
2006	97	$9.65	1,544	386	172	96
2007	118	$10.16	1,625	406	181	102
2008	125	$14.54	2,326	581	258	145
2009	153	$12.94	2,070	517	230	129
Butt						
2001	56	$22.50	3,600	900	400	225
2002	60	$14.70	2,352	588	261	147
2003	56	$22.58	3,613	903	401	226
2004	59	$19.16	3,065	766	341	192
2005	45	$4.69	751	188	83	47
2006	43	$6.73	1,076	269	120	67
2007	59	$6.21	993	248	110	62
2008	63	$15.07	2,412	603	268	151
2009	81	$18.32	2,931	733	326	183

Exhibit 5.3.1.1(cont) Summary of Statistically Inferred Load Counts Based on Level of Accuracy

Primal	Average Weekly Load Count	Average Variance of Week-to-Week Price Difference	Estimated Loads from Chebychev's (P = 0.90, c = stated value)			
			$0.25	$0.50	$0.75	$1.00
Picnic						
2001	33	$3.40	544	136	60	34
2002	31	$2.47	440	110	49	25
2003	28	$4.12	491	123	55	41
2004	28	$3.06	639	160	71	31
2005	23	$4.24	499	125	55	42
2006	27	$4.68	760	190	84	47
2007	23	$3.23	673	168	75	32
2008	23	$6.36	713	178	79	64
2009	29	$7.54	1,230	307	137	75
Rib						
2001	9	$27.53	4,406	1,101	490	275
2002	13	$33.70	5,393	1,348	599	337
2003	13	$17.07	2,732	683	304	171
2004	9	$32.37	5,178	1,295	575	324
2005	12	$21.78	3,485	871	387	218
2006	15	$24.21	3,873	968	430	242
2007	20	$22.40	3,584	896	398	224
2008	23	$25.64	4,102	1,025	456	256
2009	33	$21.51	3,442	860	382	215

Exhibit 5.3.1.1(cont) Summary of Statistically Inferred Load Counts Based on Level of Accuracy

Primal	Average Weekly Load Count	Average Variance of Week-to-Week Price Difference	Estimated Loads from Chebychev's (P = 0.90, c = stated value)			
			$0.25	$0.50	$0.75	$1.00
Ham						
2001	100	$8.56	1,370	342	152	86
2002	106	$6.17	987	247	110	62
2003	100	$7.48	1,198	299	133	75
2004	85	$13.57	2,171	543	241	136
2005	64	$6.47	1,035	259	115	65
2006	63	$12.18	1,949	487	217	122
2007	70	$10.80	1,728	432	192	108
2008	68	$24.41	3,905	976	434	244
2009	63	$28.00	4,479	1,120	498	280
Bellies						
2001	45	$22.95	3,672	918	408	229
2002	29	$28.48	4,557	1,139	506	285
2003	20	$16.33	2,613	653	290	163
2004	11	$17.98	2,877	719	320	180
2005	13	$24.70	3,953	988	439	247
2006	16	$17.45	2,792	698	310	175
2007	18	$12.41	1,985	496	221	124
2008	20	$23.32	3,731	933	415	233
2009	24	$16.76	2,682	671	298	168

Exhibit 5.3.1.1(cont) Summary of Statistically Inferred Load Counts Based on Level of Accuracy

Primal	Average Weekly Load Count	Average Variance of Week-to-Week Price Difference	Estimated Loads from Chebychev's (P = 0.90, c = stated value)			
			$0.05	$0.10	$0.25	$0.50
Carcass						
2001	410	$3.72	14,878	3,719	595	149
2002	408	$3.72	14,868	3,717	595	149
2003	366	$4.27	17,078	4,269	683	171
2004	343	$5.41	21,644	5,411	866	216
2005	306	$4.15	16,620	4,155	665	166
2006	301	$4.79	19,142	4,786	766	191
2007	344	$3.80	15,216	3,804	609	152
2008	362	$7.96	31,828	7,957	1,273	318
2009	422	$6.80	27,204	6,801	1,088	272
Live Hog	**Avg. Weekly Head Count**			**Avg. Weekly Head Count**		
2001	168,708	$4.60	18,395	4,599	736	184
2002	172,152	$8.87	35,494	8,873	1,420	355
2003	172,714	$5.17	20,671	5,168	827	207
2004	142,615	$10.06	40,239	10,060	1,610	402
2005	150,701	$8.29	33,167	8,292	1,327	332
2006	123,724	$8.41	33,623	8,406	1,345	336
2007	117,937	$5.83	23,302	5,825	932	233
2008	138,202	$10.13	40,513	10,128	1,621	405
2009	121,431	$8.04	32,176	8,044	1,287	322

Notes: Variance of price is across 52-week year. Load refers to 40,000 lbs. Data interpretation is that the inferred load count is the number of observed loads required to allow one to infer that 90% of the time the week-to-week price movement, for the respective product, will fall within a range of the previous week price level +/- the stated level of c. As the level of c decreases, the number of observations increases in order to ensure confidence in the estimate.

5.3.2 EXPORTS

Discussions with industry representatives pointed to the potential to include product trade between U.S. and Mexico and U.S. and Canada in price reporting to increase liquidity. Views were mixed as whether this "North American" trade report should replace a domestic price or be a standalone price report. An analysis of the likely increase in loads resulting from capturing Canada and Mexico trade under voluntary and mandatory price reporting was conducted (Exhibit 5.3.2.1). U.S. exports to Canada and Mexico represented slightly over 23% of total US pork exports in 2008. Of the three-year average 535,161 MT exported, approximately 290,000 MT is pork meat. Approximately, 46% of the total export volume is fresh product (not frozen, prepared, or preserved). As noted in 2.7, Mexico trade is dominated by ham, belly and sausage trade. For Canada, the export categories are more diverse.

The final column of Exhibit 5.3.2.1 provides a scenario under voluntary price reporting which additional loads could be captured by adding "North American" trade to AMS reports. The five percent level of total pork exports is in line with the percentage of total U.S. pork production now captured under voluntary price reporting. The applicable value is the voluntary column value of 1,474 loads, which would represent a five to six percent increase relative to total loads now reported under voluntary price reporting. Relative to total U.S. pork production, the simulated inclusion of pork exports to Canada and Mexico would account for approximately 0.20% to 0.25% of additional fresh pork trade—small, by any measure.

Exhibit 5.3.2.1 Assessment of Expected Pounds of Pork Captured through "North American" Trade Added to Reports

Country	Total Pork Exports[a]	% of World Total	Pork Meat Exports[b]	% Fresh[c]	Voluntary[d]
Mexico	382,603	14.4%	183,000	18%	1,054
Canada	152,559	9.0%	107,000	28%	420
MX & CN	535,161	23.4%	290,000	46%	1,474

a. Total pork trade, 3-year average (metric ton)
b. Pork meat trade, 3-year average, variety meat not included (metric ton)
c. Relative to total country/region trade
d. Carlot loads, assume 5% of trade would qualify under current rules

5.3.3 PRODUCT FORM, ENHANCED PRODUCT, AND VALUE ADDED

The issue of product heterogeneity triggered several discussions regarding the ability of alternative price reporting systems to take data from a set of heterogeneous product transactions and "back out" estimates of base values for more commodity products. The general sentiment to such an approach was varied. Some of the industry's more quantitatively advanced participants saw notable value in this approach and believed it could be feasibly accomplished by USDA. Conversely, several industry folks thought that the conversions that this process would lead to could cause more harm than good and that USDA should avoid any such attempts.

Branded Product Offerings

Capturing value added product trade would potentially enable for increased liquidity, however, application of the 3/70/20 confidentiality rule would likely eliminate branded product trade from being reportable.[68] Packers are heavily involved with own branding or branding through co-packing.

A study commissioned by the National Pork Producers Association reported 77% of fresh pork is now branded. Parcell and Schroeder (2007) showed the percentage of retail product branded (Exhibit 5.3.3.1) was much lower.

Exhibit 5.3.3.1 Branding of Pork Cuts for Retail Purchase[69]

Primal	No. of observations	% of product category
Chop	10,775	24
Rib	4,205	31
Roast	3,701	27
Ham	9,994	53
Steak	1,124	19

Product Form

Product form has evolved in the pork meat industry. Parcell and Schroeder (2007) show that for nearly 30,000 retail pork products purchased, 89% were fresh, five percent frozen, and six percent cooked (see Exhibit 5.3.3.2). The trend since the Parcell and Schroeder (2007) study has been toward more cooked product (see Exhibit 5.2.4) and more frozen product (e.g. as explained in Section 2.4). There seems to be a need to account for industry changes related to product form in order to capture a greater portion of trade for certain sub-primal products.

Exhibit 5.3.3.2 Composition of Pork Cut Product Form for Purchase[70]

Store Type	% of purchases
Fresh	89
Frozen	5
Cooked	6

Moving Day Average

Survey respondents were split evenly over applying a multi-day moving average to overcome the issue of unreportable trades due to the 3/70/20 confidentiality rule.[71] Conversations with industry representatives revealed concern with rolling between weeks and over holidays with a multi-day moving average.[72]

[68] A parallel example for beef is that under mandatory price reporting for wholesale beef "Angus" beef trade is not captured due to the binding 3/70/20 confidentiality rule.
[69] Parcell and Schroeder (2007)
[70] Parcell and Schroeder (2007). Values represent % across all cuts, so % for primal cuts is masked.
[71] A 5-day rolling average is used for boxed lamb.
[72] This concern lies with industry practices related to the weekly pricing day for pork.

5.3.4 HEDONIC ANALYSIS PRIMER[73]

A hedonic model decomposes the price of a product into component prices for each of the products' characteristics, thereby providing an estimate of the value of each characteristic independent of the products' other characteristics. Hedonic analysis is often carried out for consumer goods to enable decision makers (industry, consumers, policy makers, managers) to distinguish value across each component of the good. The hedonic model framework allows for generalities in the price-characteristic relationship to be determined regardless of an individual observation.

Assume two hams of identical size and trim. The value of cooked ham is greater than the value of a green ham. Now assume two hams differ in trim and that one ham is hickory smoked and the other ham is only cooked. Because there are multiple characteristics impacted, trim and flavor smoked, it is more difficult to determine whether, or which, characteristic has value or which characteristic may erode value. Hedonic models are particularly effective when the question of more/less value is indeterminate because of multiple differences in characteristics across products. A hedonic model can be easily re-estimated on an ongoing basis to reflect up-to-date price-characteristic relationships.

The relationship between product price and product characteristics is determined by statistically analyzing the price-characteristic relationship within a large amount of data. The more data, the greater reliability one can place on the estimated price-characteristic relationship. Furthermore, as with a large amount of data, the ability to capture a large number of characteristic differences (either in the presence of a characteristic, like solution added, or the level of characteristic, like five percent solution added versus seven percent solution added) relative to price difference yields a high level of reliability. In addition, hedonic models allow for capturing relationships between price and what are known as credence attributes. Examples of credence attributes are brand name and label attributes like 100% Organic. And, hedonic models allow for capturing relationships between price and market factors. Examples of market factors include time of sale, location of sale, days between sale and delivery, and sale quantity.

The hedonic model framework is easily applied to generate quality adjusted prices in order to provide for a series of prices that reflect a similar product, even though the observed products may be different. The Bureau of Labor Statistics commonly uses the hedonic model framework to generate time-wise quality adjusted prices that account for product variability over time. For example, a computer today is different from a computer two, five, or more years ago.

A simplified example of the hedonic model framework, applied to the primal pork Loin, follows is shown in Exhibit 5.3.4.1.

[73] See Parcell and Schroeder 2007 for a discussion of hedonic model literature and hedonic model applications.

Exhibit 5.3.4.1 Example Hedonic Model Applied to Data for Bone-In Loins[74]

	Price	*Trim*	*Vacpack*	*Gas Pak*	*Location*	*Branded*	*Moisture*	*Export*	*Load*
	A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*
1	$93	1/8”		Yes	East	CompanyA	3%	Mexico	1
2	$92	1/8”		Yes	East	CompanyA	3%		0.5
3	$90	1/8”		Yes	West	CompanyB	7%		3
4	$89	1/8”		Yes	West	CompanyB	1%		1
5	$90	1/8”	Yes		MidWest		0%		0.5
6	$92	1/8”	Yes		MidWest		0%		1
7	$93	1/8”	Yes		MidWest	CompanyA	5%	Mexico	1
8	$91	1/8”	Yes		MidWest	CompanyB	5%		1

- The statistical nature of the hedonic model allows for the evaluation of the relationship between a change in price (column A) associated with a simultaneous change in a set of characteristics (columns C, D, F, G, H, and I).
- While a subset of example data is shown, optimally a large number of observations would populate the data set and could include many more quality, credence, or market attributes.
- The base product of interest is a 1/8” bone-in Loin, VacPack, FOB the plant, non-braded, 0% moisture enhanced, sold domestically as a full carlot load.
    - For example, data row 6 fits the base product description so no adjustment is needed for the price ($92).
    - While we have included “location” we make no adjustment for location because we assume the price is quoted as FOB the plant.
    - Various methods can be applied for determining how to derive variable specification to explain price. For example, here it is assumed ½ carlot loads (rows 2 and 5, column I) should be accounted for but multiple carlot loads (row 3, column I) need not be accounted for.

The statistical analysis results yields the relationship:

Bone-in Loin Price = $90/cwt. -$1.95/cwt. x (presence of gas pak characteristic) + $0.50/cwt. x (product co-packed for company A) + $0.10/cwt. x (product co-packed for company B) - $0.20/cwt. x (percentage points moisture added) + $3/cwt. x (if product is destined for Mexico) + $1.65/cwt x (if the product is 0.50 carlot load)

We can then apply the average premium/discount, the opposite of the estimated sign is used to arrive back at a characteristic adjusted price.

	Price	*Trim*	*Vacpack*	*Gas Pak*	*Location*	*Branded*	*Moisture*	*Export*	*Load*	*Adjusted Price*
	A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*
1	$93			$1.95		-$0.50	+$0.60	-$3.00		$92
2	$92			$1.95		-$0.50	+$0.60		-$1.65	$92
3	$90			$1.95		-$0.10	+$1.40			$93
4	$89			$1.95		-$0.10	+$0.20			$91
5	$91								-$1.65	$89
6	$92									$92
7	$93					-$0.50	+$1.00	-$3.00		$91
8	$91					-$0.10	+$1.00			$92

The price on record now becomes the characteristic adjusted price specified in column J above. For this example, the average premium/discount for each characteristic, other than the brand variables (confidentiality issue), can be publically reported as long as the 3/70/20 confidentiality rule is not binding for a particular characteristic.

[74] Notes: Price is $/cwt, location refers to plant location, branded refers to product branded by hog processor for company A or company B, Export refers to destination of product, and load refers to carlot (40,000 lb) load.

CHAPTER 6: COSTS AND BENEFITS OF MANDATORY WHOLESALE PORK PRICE REPORTING

6.1 SWINE PROCESSOR COMPLIANCE COST

Industry response to inquiries related to cost of compliance for mandatory pork price reporting was mixed. Some respondents, like firms now complying with mandatory box beef price reporting, felt the cost of compliance would be small to negligible. Other respondents, such as smaller sow and boar packers felt the cost of compliance would be a burden to their business operations.

If the metrics for contributing to live barrow and gilt and live sow and boar mandatory price reporting were applied for pork meat mandatory price reporting, then each participating packer would have prior knowledge of the process used to contribute data into a centralized AMS reporting system.

Assessing the exact compliance cost, by size of processor, is difficult because there was no consistent feedback from industry participants relative to compliance costs. Thus, an average packer cost assessment is undertaken. Furthermore, the compliance costs reported by AMS in the Federal Register/Vol. 73, No.96/Friday, May 16, 2008/Rules and Regulations is followed for the current compliance cost assessment.

Compliance costs are decomposed into startup/maintenance cost (Exhibit 6.1.1), record keeping cost (Exhibit 6.1.2), and data submission cost (Exhibit 6.1.3).[75] All hourly employee costs, reported in the Federal Registrar, were adjusted for inflation. Labor hours reflect values reported in the Federal Registrar. The assumption of reporting both A.M. and P.M. reports was made and that firms report 260 days/year.

The total industry compliance cost was computed, as was a cost for only capturing barrow and gilt packing plants. Note, for the current analysis the values report the marginal cost of establishing and maintaining a wholesale pork data base and submission of information, i.e., our analysis treats this report as an addition to an existing system.[76]

An industry compliance cost of $218,000 was computed, and a barrow & gilt industry compliance cost of $151,000 was computed.

[75] We assumed that the submission time requirement for wholesale pork prices was similar to boxed beef (AMS report LS-126) so 0.125/hrs/submission was used.

[76] The value reported in the federal registrar for swine firms reflected the compliance costs of three separate swine reports, whereas for our analysis we consider compliance costs for only one report.

Exhibit 6.1.1 Electronic Submission Development and Annual System Maintenance Cost per Respondent[77]

Hours to develop and maintain interface	15
Employee compensation cost per hour	$47.09
Total annual cost per respondent	**$706.34**

Exhibit 6.1.2 Annual Recordkeeping Cost per Respondent[78]

Labor Hours per year	70
Labor cost per hour	x $22.41
Sub-Total labor cost per year	$1,569
Electronic Storage Cost	$452
Total record keeping cost	$2,020

Exhibit 6.1.3 Number of Submission Hours per Respondent per year[79]

Type	Submissions/Year		Hours/Submission		Total Hours/year	cost/hour		Total dollars/year
Wholesale Pork	520	x	0.125	=	65			
Total Cost						**$ 22.41**	**=**	**$1,457**

[77] Values taken from the Livestock Mandatory Reporting, Federal Register, 2008. Values have been adjusted for inflation.
[78] Values taken from the Livestock Mandatory Reporting, Federal Register, 2008. Values have been adjusted for inflation.
[79] Values taken from the Livestock Mandatory Reporting, Federal Register, 2008. Values have been adjusted for inflation.

Exhibit 6.1.4 Annual Cost Burden to Respondents (All Processors)[80]

	Cost per respondent		Number of Respondents		Total Cost
Startup/Maintenance	$706	x	52	=	$36,729
Record Keeping	$2,020	x	52	=	$105,064
Data Submission	$1,457	x	52	=	$75,745
Total					**$217,539**

Exhibit 6.1.5 Annual Cost Burden to Respondents (Barrow and Gilt Processors only)[81]

	Cost per respondent			Number of Respondents		Total Cost
Startup/Maintenance	$	706	x	36	=	$25,428
Record Keeping	$	2,020	x	36	=	$72,737
Data Submission	$	1,457	x	36	=	$52,439
Total						**$150,604**

[80] Values taken from the Livestock Mandatory Reporting, Federal Register, 2008. Values have been adjusted for inflation.
[81] Values taken from the Livestock Mandatory Reporting, Federal Register, 2008. Values have been adjusted for inflation.

6.2 OTHER POTENTIAL DRAWBACKS

In addition to compliance costs, other potential drawbacks to mandatory wholesale pork price reporting include potential price information losses that could occur and the potential for price transparency to increase opportunities for collusive behavior. These are specifically labeled *potential* drawbacks because they may or may not materialize.

Potential information losses associated with switching from voluntary to mandatory wholesale pork price reporting could occur from a couple of different facets. Under mandatory price reporting, AMS would adopt similar procedures they use for boxed beef reporting. That is, they would likely adopt the 3/70/20 confidentiality guideline for deciding what individual product prices are eligible to report or not report on a daily basis. Whether and how often the 3/70/20 rule would be binding and would preclude AMS from reporting a particular product price cannot be determined without an actual data test to see how often it would be binding.

There is a clear tradeoff with respect to wholesale pork price reporting relative to the confidentiality clause in that the more disaggregated and more unique detailed product specifications for which prices are reported individually, the greater the chances the 3/70/20 guidelines would be binding. On the other hand, more aggregated combining of dissimilar products into a single broadly defined product price quote is potentially of less value to market participants for discerning market signals. There is no way to determine without testing actual mandatory sample data, the optimal balance of product aggregation to report versus the impact of confidentiality binding constraints.

Another information loss that would potentially occur through mandatory price reporting is the on-going exchange of market sentiment that AMS wholesale pork price reporters now share back and forth with industry traders. That is, as price quotes arrive, the market reporter often shares this information with pork sellers and buyers as new price information is being provided in relatively informal dialogue. Presumably, much of this informal discussion and information sharing in somewhat real-time basis would largely end because the reporter would not have such information in an evolving way during the day until the formal price report is released. If such information is important to traders, they may search for other ways to collect such information such as through private information service vendors. We cannot quantify the value of this potential information timing loss.

Increased price transparency has been highlighted as having potential to enable price manipulation through collusive behavior by concentrated pork buyers or sellers. Tacit collusion is illegal, but with increased price transparency, collusion can be much more subtle. Collusion can more easily happen over time with repeated transactions, and presence of clear industry leaders, as are present in wholesale pork markets. With increased price transparency firms may start to make reasonable estimates of price offers or bids of major rival firms and may even send signals through bidding behavior or announcements of strategy to other buyers or sellers. Wachenheim and DeVuyst (2001) provide detailed discussion of this potential for collusive behavior under livestock mandatory price reporting. A classic study by Albaek, Mollgaard, and Overgaard (1997) in the Danish concrete industry concluded that

publication of firm-specific transactions prices for ready-mixed concrete in Denmark, reduced the price competition among oligopolistic concrete producers and lead to increased prices. To date we know of no study that has demonstrated price collusion in wholesale beef markets following mandatory price reporting enactment in 2001. Thus, the validity of this concern is untested.

6.3 SOCIETAL BENEFITS

Quantification of benefits associated with mandating wholesale pork price reporting could arise from improved price information and transparency which potentially provides many societal benefits. A classic study on the value of price information is Stigler's 1961 "Economics of Information." He argues that "ascertainment of market price" (p. 213) is one the most important dimensions of economic information.

Bloomfield and O'Hara (1999) conducted a set of economic experiments in laboratory settings to test several theories about market transparency. Their conclusions include that trade disclosure results in more rapid convergence of bid and ask prices to the true equilibrium. This suggests with enhanced price reporting, prices for wholesale pork transactions will be more informed and be more likely to represent true supply and demand conditions. Having more reliable price information as mandatory price reporting would presumably provide would increase transparency by having fewer non-quotes. More frequently available price quotes add to market efficiency.

Price discovery is a time consuming activity and because small operations (both pork sellers and buyers) have access to less private information, they rely more heavily on public information. As such, if mandatory price reporting results in more price quotes available, it would likely benefit smaller firms more than large firms, many of whom have considerable private information about their own wholesale pork transactions. However, a caveat is that larger firms also have a comparative advantage for data analysis and more intensive data availability favors those better suited for analysis.

Overall, increasing pricing efficiency through lower costs of price discovery, less dispersion in prices for similar quality products, more rapid conversion to equilibrium prices, and more trust in public reported prices should benefit both hog producers and pork consumers. However, quantifying these benefits is beyond the scope of this study. Change from voluntary to mandatory wholesale pork price reporting in and of itself would likely result in a relatively modest increase in price transparency. That said, since a lot of wholesale pork is formula priced, increased convergence of prices to equilibrium has a direct effect on both future cash and all formula trade.

6.4 SUMMARY

Concerns about public wholesale pork market price reports released by the United States Department of Agriculture Agricultural Marketing Service (AMS) have lead to increasing discontent among industry participants with the pricing information available in conducting business in the wholesale pork market. As a result of these concerns, industry participants

have suggested a range of adjustments to AMS wholesale pork price reporting procedures. The purpose of this research report was to summarize industry sentiment regarding current price reporting, identify possible methods for improving the sentiment, and to assess economic tradeoffs of moving from the current voluntary wholesale pork price reporting to a mandatory price reporting system.

In summary, multiple adjustments to the current wholesale pork price reporting system are worthy of consideration. While individual sentiments varied through the industry, there is relatively little resistance to the notion of mandating price reporting of wholesale pork transactions. However, nearly every discussion with industry personnel highlighted views that simply mandating the current price reporting system will not be sufficient to alleviate current concerns. Rather, additional adjustments must be considered whether wholesale pork price reporting remains voluntary or switches to mandatory status. In particular, adjustments suggested for consideration include: adding pork destined for Canada or Mexico to domestic price reports, extending the window by about one more week for which transactions are considered "negotiated," and adding pumped and other enhanced products for which acceptable conversions can be made by AMS to the list of eligible products.

While this project report summarizes the current sentiment of wholesale pork market participants and discusses multiple methods by which price reporting may be improved, several issues remain. For instance specific estimates are needed such as the proportion of trade that may be impacted by implementing confidentiality rules that come with mandatory price reporting (e.g., "3/70/20 rule") and the volume of additional industry trade that would be captured under alternative price reporting requirements (e.g., exact impacts of extending the negotiated window width). Unfortunately, estimates on these types of issues will remain largely unobtainable until changes are made to the price reporting system and ex post analyses can be conducted. Accordingly, the best available information is industry sentiment and perceptions on these issues, which are highlighted in this report.

Over time, the distribution of net benefits to hog producers, hog packers, and pork buyers of adjusting the wholesale pork price reporting system along with the relative value of market information captured in current price reporting schemes must be routinely evaluated to assess if the reporting system in place is meeting its intended goals. Accordingly, this project is far from resolving the issue of wholesale pork price reporting. Rather, this report aims to enhance ongoing discussions on the subject to further ensure an improved system can be identified, developed, and implemented to best serve the U.S. wholesale pork marketplace.

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APPENDICES

APPENDIX A: SURVEY INSTRUMENT[82]

RE: USDA/AMS Wholesale Pork Price reporting project: Survey Completion Request

Good afternoon NAME,

You may recall recently visiting with me (Glynn Tonsor), Ted Schroeder (Kansas State Univ.), and/or Joe Parcell (Univ. of Missouri) in recent weeks regarding the project we are conducting for USDA. In particular, our project is assessing a range of issues regarding the wholesale pork price reporting system. I'm following up with this email to request your assistance in our effort to capture the thoughts and views of industry participants on a range of issues in this project. In particular, I'd like you to complete a short survey we believe will take about 15 minutes, which can be accessed at:

http://www.surveymonkey.com/s.aspx?sm=qJ6PhIlmltFhhlvRggVIFA_3d_3d

You will recall from prior discussions that all responses will be kept in confidence and that only aggregated results will be used in our project report. Moreover, if you would prefer to complete this survey in hard-copy form, you are welcome to do that as well by completing a copy you already have, printing it from this link, and/or emailing me for a copy to be mailed to you. As we have previously noted, we sincerely value and need your input to help us best assess and summarize industry views in our project.

If you have any questions or concerns, please don't hesitate to contact me. Otherwise, I want to thank you again for you time in completing this survey.

[82] Producer associations and hog packers were provided similar, but slightly different surveys to better reflect their respective situations. Appendix A only presents the pork buyer survey, but these other two survey formats are available from the authors.

3. Pork Buyer Survey Questions

1. Please indicate your perception of each of the following statements as they relate to USDA market news pork price reporting:

	Agree	Neutral	Disagree
Daily individual cut prices are representative of trade	◯	◯	◯
Daily primal prices are representative of trade	◯	◯	◯
Daily cutout prices are representative of trade	◯	◯	◯
Trade volume represented in pork price reports is adequate	◯	◯	◯
We favor continued voluntary as opposed to mandatory pork price reporting	◯	◯	◯
We favor mandatory pork price reporting for packers that already are mandated to report barrow and gilt prices	◯	◯	◯
We favor mandatory pork price reporting for packers that already are mandated to report sow prices	◯	◯	◯
Canada and Mexico pork export prices should be incorporated into pork price reports	◯	◯	◯
Rest of World (other than Canada and Mexico) pork export prices should be incorporated into pork price reports	◯	◯	◯
Value-added pork products should be incorporated into pork price reports	◯	◯	◯
There is value in having access to domestic transaction volume information, even without any price information	◯	◯	◯
There is value in having access to export transaction volume information, even without any price information	◯	◯	◯
USDA should reduce truck load volume requirements for pork price reporting	◯	◯	◯
USDA should increase truck load volume requirements for pork price reporting	◯	◯	◯
USDA should report formula price transactions	◯	◯	◯
USDA should report sow meat negotiated cash transactions	◯	◯	◯

2. Which of the following USDA market news pork price reported values do you regularly use?

(check all that apply)

- ☐ daily cutout value
- ☐ weekly cutout value
- ☐ daily primal values
- ☐ weekly primal values
- ☐ daily individual cut values
- ☐ weekly individual cut values

3. For the following primal, or cuts from that primal, what is the most appropriate time window to consider as the "negotiated cash" market?

(choose only one time period for each primal)

	0-7 days forward	0-10 days forward	0-14 days forward	0-21 days forward	0-28 days forward
Loin	◯	◯	◯	◯	◯
Butt	◯	◯	◯	◯	◯
Picnic	◯	◯	◯	◯	◯
Rib	◯	◯	◯	◯	◯
Ham	◯	◯	◯	◯	◯
Bellies	◯	◯	◯	◯	◯

Other (please specify)

4. Would you support use of multi-day rolling averages to manage 3/70/20 (If you would like more information on the 3/70/20 rule click here.) confidentiality issues that may arise on individual pork cuts under a mandatory pricing system to enable more frequent reports where confidentiality would otherwise prevent a price report that day?

◯ Yes ◯ No

Additional Comments:

5. Does USDA call your firm to confirm pork trades?

◯ Yes ◯ No

6. If yes to question five, what best describes the approximate frequency of these calls?

◯ Daily ◯ Monthly ◯ Annually

◯ Weekly ◯ Quarterly ◯ Less than once a year

7. How many pounds of each primal, or cuts from that primal, does your firm typically purchase during a year?

(if you do not purchase products from a particular primal category leave it blank)

Loin	
Butt	
Picnic	
Rib	
Ham	
Bellies	

8. For the following primal, or cuts from that primal, what percentage of your operations' purchases are typically in fresh form (rather than frozen)?

(if you do not purchase products from a particular primal category leave it blank)

Loin	
Butt	
Picnic	
Rib	
Ham	
Bellies	

9. For the following primal, or cuts from that primal, what percentage of your operations' purchases are typically in pre-cooked form?

(if you do not purchase products from a particular primal category leave it blank)

Loin	
Butt	
Picnic	
Rib	
Ham	
Bellies	

10. For the following primal, or cuts from that primal, what percentages of your operations' purchases are typically solution added?

(if you do not purchase products from a particular primal category leave it blank)

Loin
Butt
Picnic
Rib
Ham
Bellies

11. For the following primal,or cuts from that primal, what percentage of your operations' purchases are typically cured or smoked?

(if you do not purchase products from a particular primal category leave it blank)

Loin
Butt
Picnic
Rib
Ham
Bellies

12. For the following primal, or cuts from that primal, what percentage of your operations' purchases are typically NEGOTIATED CASH trade for delivery 0-10 days forward?

(if you do not purchase products from a particular primal category leave it blank)

Loin
Butt
Picnic
Rib
Ham
Bellies

13. For the following primal, or cuts from that primal, what percentage of your operations' purchases are typically formula price using the USDA WEIGHTED AVERAGE?

(if you do not purchase products from a particular primal category leave it blank)

Loin	
Butt	
Picnic	
Rib	
Ham	
Bellies	

14. For the following primal, or cuts from that primal, what percentage of your operations' purchases are typically formula price using the USDA TOP OF MARKET?

(if you do not purchase products from a particular primal category leave it blank)

Loin	
Butt	
Picnic	
Rib	
Ham	
Bellies	

15. For the two pork primal groups listed below and for which you purchase using NEGOTIATED CASH trade, what is the approximate percentage delivered within each number of days after purchase?

(We have grouped the primals for reporting convenience, please respond based on typical practices for an individual, sub-group, or all primals for the groupings given)

	0-7 days foward	8-14 days foward	15-28 days foward	29-90 days foward	Over 90 days foward
Hams and Bellies					
Loin, Butt, Picnic, & Ribs					

16. For the two pork primal groups listed below and for which you purchase using FORMULA trade, what is the approximate percentage delivered within each number of days after purchase?

(We have grouped the primals for reporting convenience, please respond based on typical practices for an individual, sub-group, or all primals for the groupings given)

	0-7 days foward	8-14 days foward	15-28 days foward	29-90 days foward	Over 90 days foward
Hams and Bellies					
Loin, Butt, Picnic, & Ribs					

17. Please provide us any additional comments you would like about USDA pork price reporting.

18. Please provide the following contact information for confirmation so that we do not duplicate firm contacts. This information will not be retained.

If you have questions, please feel free to contact Ted Schroeder (785) 532-4488, Glynn Tonsor (517) 353-9848, or Joe Parcell (573) 882-0870.

Contact Name	
Company	
Position Title	
Phone Number	
Email	