

Composition and Value of the Shoulder Primal

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The purpose of this paper is to make pork producers aware of the composition and value variation that could be expected given a specific set of parameters that represent the type of hogs marketed in the U.S. Interest in the pork harvesting and processing industries has climbed as producers try to capture more of the retail value of the pork they produce. This interest has resulted in the need for accurate information regarding the variability in that exists in the hogs marketed in the U.S. and the variation in carcass composition and value produced by the carcasses of these pigs.

A National Pork Board funded project has resulted in the development of a model that takes into account numerous variables to predict the value of the carcasses that will be produced under given scenarios. For the purposes of this paper, we assumed that the group of market hogs was a mix of 50 percent barrows and 50 percent gilts, had a 250 lb average weight, had their carcasses evaluated using a Fat-O-Meat'r™, had a distribution of live weight from 230 to 270 pounds, and produced carcass yields greater than 75 percent. These values were chosen as they would be representative of the majority of the pigs marketed in the U.S. Certainly, variation due to sex, average live weight, distributions of live weight, yield differences, and methods of carcass evaluation contribute to carcass value variability. Additionally, the method of processing, whether a bone-in or boneless products are desired, can impact the value of a carcass.

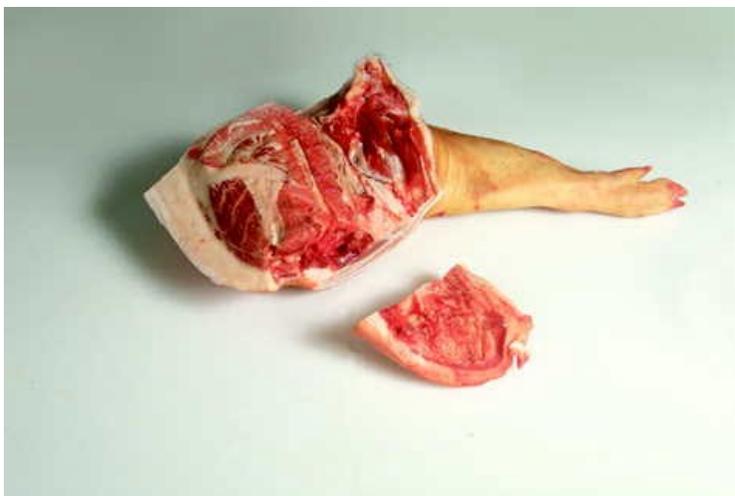
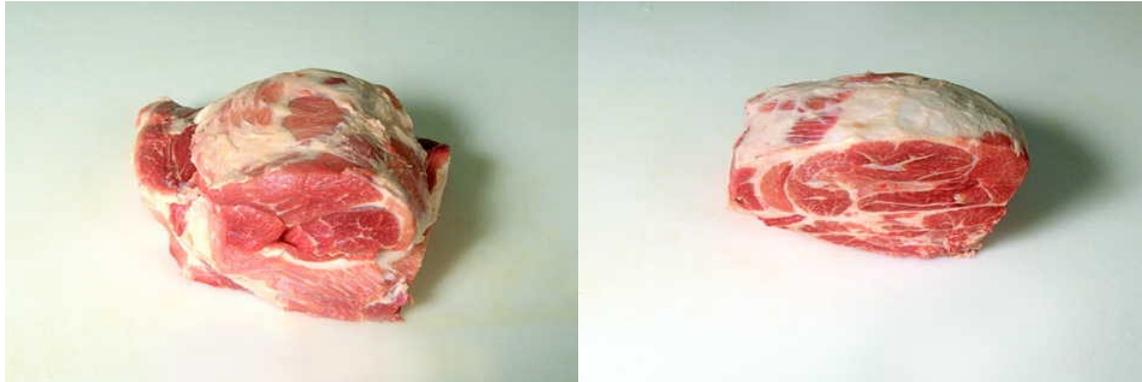


Figure 1. An example shoulder primal obtained from a pork carcass.

The shoulder (Figure 1) of a pork carcass is processed into two wholesale cuts, the Butt also known as the Boston Butt or Shoulder Butt and the Picnic also known as the Picnic

Shoulder or the Arm Shoulder. The Picnic Shoulder is obtained from the lower portion and the Boston Butt is obtained from the upper portion of the whole pork shoulder (Figure 2).



Picnic Shoulder

Boston Butt



Jowl

Figure 2. The Picnic Shoulder, Boston Butt, and Jowl pork cuts obtained from the shoulder primal.

The primary retail cuts obtained from the Boston Butt and the Picnic Shoulder are Blade and Arm / Picnic roasts (bone-in or boneless), and Blade and Arm steaks. Additionally, the Picnic and Blade roasts are available in smoked versions at most retail outlets.

The wholesale Boston Butt and Picnic Shoulder weights and value were predicted using the newly developed Whole Hog Value Calculator (WHVC) model that will be discussed in detail in a later chapter of these proceedings. Weights of the wholesale shoulder cuts, trim and fat were predicted for the example group of market hogs. Backfat and loin muscle area for the group of market hogs that averaged 250 pounds are shown in Table 1. Additionally, the expected range of backfat and loin muscle depth that are obtained when the acceptable market hog weight range is from 230 to 270 pounds is also included (Table 1). These values provide a reference, which indicates the size of the shoulder wholesale cuts that can be expected from the

group of market hogs having the specified weight range and average with the representative backfat and loin muscle depth.

Table 1. Wholesale shoulder cuts, by-products, and value from a group of market hogs having an average weight of 250 pig and range of weights of 230 to 270 pounds.

Item	Average	Expected Range	
	250 lb Market Hog	230 lb Market Hog	270 lb Market Hog
Carcass Weight, lb	187.5	172.5	210.0
Yield, %	75.0	75.0	75.0
Backfat, in.	0.70 (17.8)	0.61 (15.5)	0.78 (19.8)
Loin Muscle Depth, in. (mm)	2.22 (56.4)	1.96 (49.8)	2.44 (62.0)
Picnic Shoulder Weight, lb	10.23	9.48	11.07
Picnic Shoulder Price, \$/lb	0.45	0.45	0.45
Picnic Shoulder Value, \$	4.60	4.27	4.98
Picnic Fat, lb	0.54	0.50	0.68
Fat Price, \$/lb	0.23	0.23	0.23
Picnic Shoulder Fat Value, \$	0.12	0.12	0.16
Total Picnic Shoulder Value, \$	4.72	4.39	5.14
Boston Butt Weight, lb	9.58	8.99	10.06
Boston Butt Price, \$/lb	0.90	0.90	0.90
Boston Butt Value, \$	8.62	8.10	9.06
Boston Butt Fat, lb	1.26	1.16	1.69
Fat Value, \$/lb	0.23	0.23	0.23
Boston Butt Fat Value, \$	0.29	0.27	0.39
Boston Butt Value, \$	8.91	8.37	9.45
Shoulder Trim, lb	1.40	1.29	1.92
Shoulder Trim Value, \$/lb	0.27	0.27	0.27
Shoulder Trim Value, \$	0.39	0.35	0.52
Jowl Weight, lb (jowl skin weight is included in by-products and not in this weight)	1.58	1.42	1.73
Jowl Price, \$/lb	0.27	0.27	0.27
Jowl Value, \$	0.43	0.38	0.47
Total Shoulder Value, \$	14.45	13.49	15.58
Total Carcass Shoulder Value, \$	28.90	26.98	31.16

To value the shoulder primal, the prices of the Picnic Shoulder, Boston Butt, Jowl, trimmings, and the 52-week average for 2001 were obtained from the USDA Agricultural Marketing Service. The wholesale prices reported are for bone-in products that have been trimmed to ¼ inch of external fat. Prices reported for wholesale cuts are more consistently reported when compared to prices of various retail cuts of pork. Combined with the fact that all processors do not fabricate the carcass into the exact same retail cuts, prices for the specific wholesale cuts were chosen as the best way to consistently value the example pork carcasses. Unlike some other wholesale pork cuts, those obtained from the shoulder are not differentially priced based on their weight. This makes determination of the shoulder primal pork cuts value somewhat easier when compared to other wholesale pork cuts that can have considerable weight variation depending on the size of market hog from which they are obtained.

It should be noted that prices quoted are for Boston Butt 406, Picnic 405, and Jowl 419. The terms Boston Butt 406, Picnic 405, and Jowl 419 come from the Institution Meat Purchase Specification. This guide provides detailed specifications for various meat cuts so that some standard definition exists. The guide details how much trim is left on the cut, specifically spells out how the item is cut from the primal, what muscles, bones, skin, etc. is removed and what must be remaining on the particular meat cut to meet specifications. All of the guidelines must be followed for the particular cut to be termed a Picnic 405 Boston Butt 406, Jowl 419, or any other cut of meat. These guidelines and standard cut definitions is what the USDA Market News Service utilizes to determine the value of a standardized cut. Because pork processing companies or even processing plant within a company does not process carcasses in the same manner, standardized definitions are needed for a consistent pricing mechanism.

The weight and value of the shoulder primal differ, as the size of the market hog gets larger (Table 1). The wholesale Boston Butt and Picnic Shoulder weights from a group of market hogs that average 250 lb live weight at harvest were 9.58 and 10.23 lb, respectively. The weight of the Boston Butt and Picnic Shoulder were multiplied by the 2001 52-week average wholesale prices which were \$0.90 and \$0.45 per lb, respectively. The group average 250 lb pig provided a single Boston Butt value of \$8.62 and single Picnic Shoulder of \$4.60. However, we know that not all animals will weigh exactly 250 lb at marketing. A group of market hogs, whether we are talking about a semi load, daily, weekly, monthly, yearly groups, or plant average, will have weights that vary considerably. The weight variation contributes to considerable weight and value variation among the primal cuts and wholesale or retail cuts obtained from the defined group of market hogs. The market hog live weight range, 230 to 270 lb, utilized in the examples we have defined, produced variation in the cuts obtained from the shoulder primal. The range of Boston Butt and Picnic Shoulder weights were 8.99 to 10.06 and

9.48 to 11.07, respectively. Similar range in values for the Boston Butt and Picnic Shoulder, \$8.10 to \$9.06 and \$4.27 to \$4.98, respectively, would be expected from a group of market hogs that had a live weight range from 230 to 270 lb.

The weight of fat obtained from the Picnic Shoulder and Boston Butt averaged 0.54 and 1.26 lb, respectively. Like the cuts, the amount of fat trimmed ranged from 0.50 to 0.68 lb from the Picnic Shoulder and 1.16 to 1.69 lb from the Boston Butt. Albeit not as great as lean meat, fat does have a market value and is sold as edible fat in the wholesale market. This fat can be added to products like sausage, hot dogs, and other edible goods. The average weight of fat obtained from the shoulder of the defined group of market hogs (250 lb live weight average and range of live weights from 230 to 270 lb) has a value of \$0.41 (\$0.12 from the Picnic Shoulder and \$0.29 from the Boston butt). The range in fat value of shoulder fat obtained from the defined group (230 to 270- lb) was \$0.39 to \$0.55 (from \$0.12 to \$0.16 from the Picnic Shoulder and from \$0.27 to \$0.39 from the Boston Butt). If producers thinking of entering the processing business do not plan to market such items as fat, these products will become a liability and will become an expense to the operation in order to properly dispose of these items.

In addition to the wholesale cuts and fat, the average weight of shoulder trimmings from the defined group of market hogs was 1.40 lb. The 2001 52-week USDA reported average wholesale price for 42% trim was \$0.27 per lb hence; the average value of trimmings from the defined group of market hogs was \$0.39. As you might expect, not every market hog in the defined group had exactly the same weight or value of shoulder trim. The weight of shoulder trim ranged from 1.29 to 1.92 lb while the value of the shoulder trim ranged from \$0.35 to \$0.52.

The Jowl is also considered a portion of the shoulder and has some value and is the small piece of meat that is pictured beside the shoulder in Figure 1. For the purposes of this evaluation the Jowl was skinned, thus the portion of the Jowl valued with the shoulder only includes the soft tissue. The skin from the Jowl is valued in the by-products section of this symposium. The skinned Jowl average weight was 1.58 lb from the defined group and had a value of \$0.43. The Jowl weight range was from 1.42 to 1.73 lb from the group of market hogs weighing from 230 to 270 lb live weight. The range in Jowl value from this group was \$0.38 to \$0.47. Since the Jowl was skinned, the author made the decision to classify and value this product as trim.

While the value of fat, trim and Jowl obtained from a single side of a carcass does not appear to greatly change the value of a single shoulder primal, one should consider that each market hog will produce twice the weight and value of each product. Additionally, if these values were multiplied by the number of market hogs processed in a day, week, month, or year, a large sum of money could be added to the bottom line of the operation. Additionally, it may be possible to add value to some of these products. For example, the Jowl can be processed in a

variety of ways to add value. Currently, a processor is harvesting a small portion (2 ½ to 3 square inches) of Jowl that is marketed as a “Korean” Jowl. This highly marbled piece of meat is considered a delicacy in some markets and is adding considerable value to a cut that is generally regarded as a low value item.

The average total value of a single pork shoulder (Picnic Shoulder, Boston Butt, Jowl, fat, and trimmings total) was \$14.45 and ranged from \$13.49 to \$15.58 in the defined group of market hogs. The average total shoulder value is doubled to \$28.90 as are the range of values from the group to yield a range of total carcass shoulder value from \$26.98 to \$31.16.

The average total weight of the wholesale shoulder cuts (2 each of the Boston Butt, Picnic Shoulder, and Jowl) represents 22.8 percent of the carcass weight obtained from the average (250 lb live weight) of the defined example group of market hogs. This value ranged from 21.8 to 23.1 percent from the same example group having the live weight range from 230 to 270 lb.

Quality is a concern for all pork wholesale cuts. However, the quality of wholesale or retail shoulder cuts has not been evaluated traditionally. Quality of shoulder cuts is not a large concern when compared to other pork products like the loin, belly, or ham because these cuts are frequently further processed into products like sausage, bratwursts, luncheon meats, etc. The quality of the meat cuts used in these types of products is more easily manipulated or masked by the further processing.

The Picnic Shoulder and Boston Butt markets are similar to other pork wholesale cuts and to various commodities in that seasonal and/or monthly price variation exists. Four-year (1998 -2001) monthly averages were calculated from the price information obtained from the USDA Market News Service (Figure 3.). Generally, the peak price for Picnic Shoulders and Boston Butts occurs in May – June while the lowest prices occur in the winter months from November to January. Monthly Boston Butt price variation very closely follows that of base carcass price.

The peak price months corresponds to times when consumers begin more outdoor activities. Consumers begin to fire up the grill and demand for further processed products like hot dogs and bratwursts increases. Additionally, barbecued pork has a rich tradition in the U.S., particularly in south. The Boston Butt and Picnic Shoulder are cuts generally favored in the barbecue trade to make “pulled pork”. Further processed and barbecued pork contributes to the Picnic Shoulder and Boston Butt demand peak experienced in the summer months. This presents both a challenge and an opportunity to pork processors.

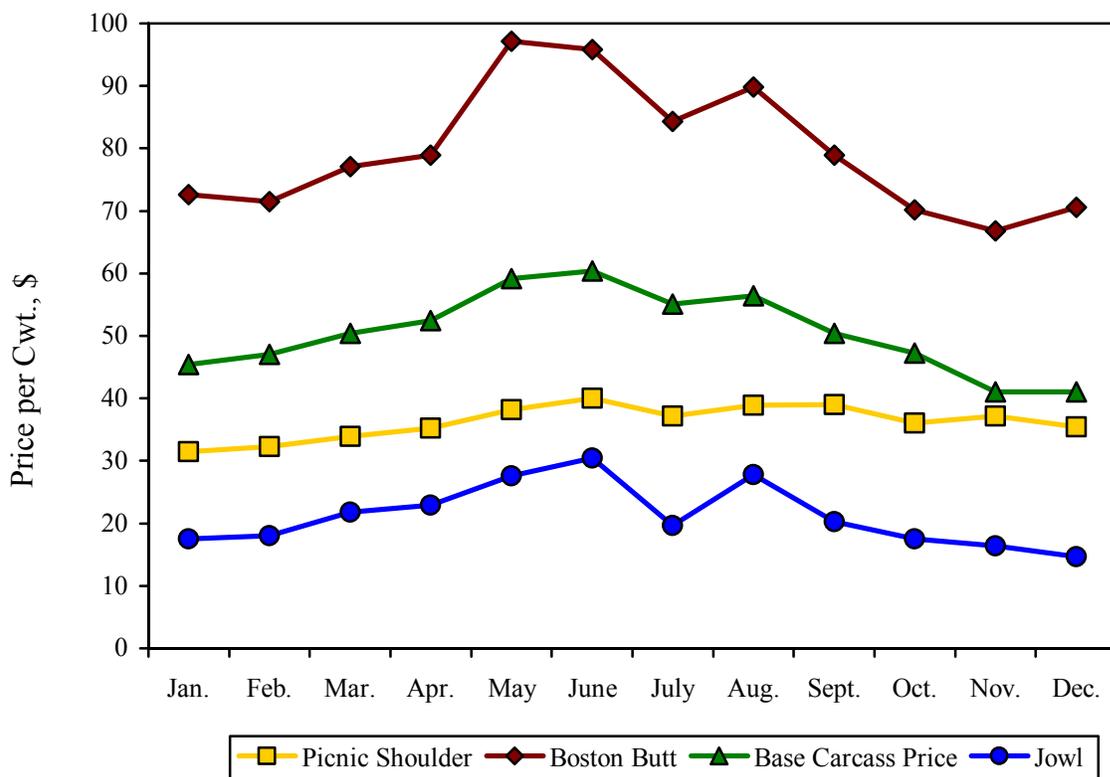


Figure 3. The 1998 through 2001 average monthly wholesale Boston Butt, Picnic Shoulder, and base pork carcass price (USDA Agricultural Marketing Service).

Processors or those thinking of entering the processing business must consider the demand cycle for the shoulder products. Since a pork carcass can yield a maximum of two Picnic Shoulders and two Boston Butts, a system must be in place to deal with seasonal demand changes if processors want to avoid selling their products when demand and price obtained is lowest. This is largely accomplished through cold storage of these products during the months when demand is low and pulling from cold storage stocks when demand increases. Processors should weigh the expected future market price minus the cost of storage against the current market price to determine if storage of Boston Butts and Picnic Shoulders is potentially profitable or if selling them on the present open market is a better alternative.

Summary

It has been demonstrated that considerable composition and value variation can be expected from the shoulder primal given a specific set of parameters that represent the type of hogs marketed and the way in which they are evaluated. It should be recognized that values different from the original assumptions (250 lb average weight of the group, 230 to 270 lb acceptable weight range, group of ½ barrows and ½ gilts (mixed sex), evaluated with the fat-O-

meter, and having a carcass yield greater than 75 percent) used in this presentation will result in different weights and values of products obtained from the shoulder primal. Producers interested in the pork harvesting and processing industries must take into consideration these variations when accessing their ability to market the products they will produce. The Whole Hog Value Calculator tool described in a later chapter of these proceedings can be used to estimate the value of the pork cuts obtained the shoulder primal given a variety of variables that can differ from producer to producer and from pork processor to pork processor. I would encourage any group or individual that is considering entering into the processing industry to utilize this tool. By entering information specific to their operation a more accurate evaluation of their situation will occur.