

Isolating Tender Muscles in the Pork Shoulder

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Dennis N. Marple, Professor of Animal Science,
Joseph G. Sebranek, University Professor of Animal
Science and of Food Science and Human Nutrition
Ben Huisinga, Graduate Assistant, Animal Science

Summary and Implications

A procedure was developed to remove the Supraspinatus, Infraspinatus, Subscapularis, Triceps brachii (picnic cushion), Teres major and the flat portion of the Pectoralis profundi from pork shoulders separated from the carcass leaving either 2 or 4 ribs on the shoulder. The results of the study demonstrated that the composition of the residual picnic trim was not altered by removal of these key shoulder muscles in 4-rib shoulders. Therefore, processors could consider adding value to 4-rib pork shoulders without altering the composition of the picnic trim by isolating and merchandising specific shoulder muscles that have favorable eating qualities.

Introduction

The initial phase of a muscle profiling study characterized physical, chemical and eating properties of 26 muscles in the pork shoulder and ham. From these results, several muscles were identified as being very tender with desirable color and texture. These muscles are located in the carcass such that they may have value as new fresh pork products because they are not now utilized to their full advantage. Specifically, the flat portion of the Pectoralis profundi and the Triceps brachii of the shoulder were selected as muscles with potentially greater economic opportunity than currently realized. The results also identified three muscles located adjacent to the blade bone as being particularly tender with good color and excellent potential market value. However, processors perceived these muscles as too difficult to acquire using traditional cutting methods employed by the pork processing industry. These muscles are the Supraspinatus and Infraspinatus located on the exterior surface of the blade bone and the Subscapularis muscle attached to the interior surface of the blade bone. An additional small, tender muscle, the Teres major, is located adjacent to the posterior side of the blade bone and may be accessible depending on the cutting methods used. Processors also expressed concern that removal of these muscles might change the composition, and consequently the value of the boneless picnic traditionally used for further processing.

The goal of the study was to determine the changes in composition of the boneless picnic following removal of selected muscles from the pork shoulder.

Materials and Methods

Forty pork carcasses of similar weight and composition were selected at a commercial pork processing facility. Twenty shoulders were separated from carcasses leaving two ribs on the shoulder and twenty shoulders were separated from carcasses leaving four ribs on the shoulder. Within each group (two-rib or four-rib), ten shoulders were from left sides and ten shoulders were from right sides of the carcasses. Shoulders were cut to remove the key muscles (Supraspinatus, Infraspinatus, Subscapularis, and Teres major) adjacent to the blade bone as well as the Triceps brachii and the flat portion of the Pectoralis profundi. Weights of each of the above muscles as well as those of fat, bone and adjacent trim were recorded. The identity of each cut or muscle removed was maintained as well as all trim removed during the cutting process. All soft tissue was ground and analyzed to determine the amount of fat in each remaining portion of the shoulder.

Results and Discussion

There were no significant interactions between the number of ribs on the shoulder and side from which the shoulder was taken for any of the variables measured in the study. The results are shown in Table 1. The key differences found were attributed to the number of ribs on the shoulder and the observation that portions of some of the muscles were left with the carcass when the shoulder was separated between the second and third ribs. Weights of muscles did not differ between side of the carcass. Likewise, the yield of the shoulder was not influenced by the side from which data were obtained. The weights of the boneless butt, Pectoralis profundii, Triceps brachii, Teres major and Infraspinatus were greater from 4-rib than 2-rib shoulders since a greater portion of each of these was left on the carcass when the shoulder was separated between the second and third ribs (Table 1). Weights of picnic trim and remaining trim were also greater in the 4-rib shoulders but the percent lean of the picnic trim was similar between the 2-rib and 4-rib shoulders.

Many of the muscles being studied are severed when the shoulder is separated from the carcass between the second and third ribs, and the effect of severing these muscles is noted by reduced weights of some muscles from the 2-rib shoulders. The greater percent lean found in the portion labeled Other Trim was not expected and is attributed to experimental error based on variation in trimming the Triceps brachii or picnic cushion muscles. The key finding was that the percent lean of the picnic trim was not altered by removing selected individual shoulder muscles. This finding answers the main question raised by representatives of processors during a previous discussion of the first phase of the muscle separation study. As a

result, isolation of these muscles from shoulders separated between the fourth and fifth ribs provides an opportunity to merchandise fresh pork muscles having desirable eating properties without altering the distribution of fat and lean in picnic trim used for further processing. This strategy may capture value of shoulder muscles as new fresh pork products that otherwise would be utilized as boneless picnics for further processed pork products.

Table 1. Average Weights and Composition of Shoulder Components¹

<u>Item</u>	<u>2 Ribs</u>	<u>4 Ribs</u>
Shoulder Wt - lbs	26.41	30.78
Foot Wt- lbs	1.05 R	1.01
Jowl Wt - lbs	2.10	2.12
Skin Wt - lbs	1.68	1.88
Neckbones Wt - lbs	1.27	1.70
Rib Wt - gm	129.30	293.10
Butt Wt - lbs	5.25	6.06
Pectoralis Wt - gm	320.90	498.60
Triceps brachii Wt - gm	664.70	912.00
Teres major Wt - gm	106.10	139.40
Subscapularis Wt - gm	161.20	154.90
Supraspinatus Wt - gm	501.20	499.00
Infraspinatus Wt - gm	335.70	396.70
Bones Wt - lbs	2.06	2.15
Picnic trim Wt - lbs	4.83	5.36
Other Trim wt - lbs	3.17	3.96
Picnic - % Lean	80.11	80.40
Other Trim - % Lean	56.15	49.93

¹Means in the same row in bold differ (P<.05)

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