

Retail Yield and Fabrication Times for Veal as Influenced by Purchasing Options and Merchandising Styles¹

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ABSTRACT: Twenty-nine selected styles of subprimals or sections of veal were obtained from a commercial facility to assist in the development of a support program for retailers. They were fabricated into bone-in or boneless retail cuts and associated components by trained meat cutters. Each style selected ($n = 6$) was used to generate mean retail yields and labor requirements, which were calculated from wholesale and retail weights and processing times. Means and standard errors for veal ribs consisting of five different styles ($n = 30$) concluded that style #2, 7-rib 4 (10 cm) \times 4 (10 cm), had the lowest percentage of total retail yield ($P < .05$) owing to the greatest percentage of bone. Furthermore, rib style #2 required the longest total processing time (P

$< .05$). Rib styles #3, 7-rib chop-ready, and #5, 6-rib chop ready, yielded the greatest percentage of total retail yield and also had the shortest total processing time ($P < .05$). Within veal loins, style #2, 4 (10 cm) \times 4 (10 cm) loin kidney fat in, had the greatest percentage fat ($P < .05$). Loin styles #2 and #3, 4 (10 cm) \times 4 (10 cm) loin special trimmed, generated more lean and fat trimmings and bone, resulting in lower percentage of total retail yields than loin style #1, 0 (0 cm) \times 1 (2.5 cm) loin special trimmed ($P < .05$). Results indicated that bone-in subprimals and sections required more processing time if fabricated into a boneless end point. In addition, as the number of different retail cuts increased, processing times also increased.

Key Words: Veal, Retail Marketing, Yields, Time Allocation

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Introduction

Carcass values are derived primarily from lean color in veal carcasses. Prices may differ as much as 30% among carcasses, solely based on lean color (McKeith and Wilson, 1994). The most desirable carcasses (special-fed veal) display a light grayish-pink color and are of higher value than grain-fed veal, which displays a darker grayish-pink to red color. Prices for veal are considerably higher than those for other meats, and this can significantly affect veal consumption. These higher prices, at least in part, are attributed to the limited supply of veal calves in the

United States. In fact, Americans consume .55 kg of veal per year as compared to 28.9 kg of beef per year (USDA, 1996). However, despite the limited per capital veal consumption, retailers still insist on effective ways to purchase and merchandise their product.

Veal retailers could benefit economically from processing information (retail yields and fabrication times) with regard to different fabrication and merchandising methods. Innovative merchandising styles may result in an increase in consumer interest in veal cuts and greater profitability for retailers merchandising this product.

Recently, purchasing and merchandising information has become available for beef, pork, and lamb retailers through a computer software program referred to as Computer Assisted Retail Decision Support, or CARDS (Garrett et al., 1991; Lorenzen et al., 1996a,b, 1997). However, a comparable CARDS software program for veal retailers had not been developed. Processing information from this study helped create a CARDS program for veal and aid in the completion of the CARDS software package for retailers.

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Materials and Methods

Product Selection

Selected bone-in and boneless veal subprimals (n = 174) selected randomly were obtained from the fabrication line at a commercial veal-processing facility in the United States. The selected product complied with the Institutional Meat Purchasing Specifications (**IMPS**) for veal (USDA, 1995; NAMP, 1997). Cutting styles were developed with input from the selected veal-processing facility, the staff of the National Cattlemen's Beef Association, and representatives from Texas State Technical College and Texas A&M University.

Data Collection

Bone-in and boneless subprimals were fabricated by professional meat cutters from Texas State Technical College, Waco. Each cutting test was recorded and monitored by experienced technicians, who recorded times to the nearest .01 s using hand-held stop-watches. The meat-cutting duties were allocated into times consisting of five phases for each subprimal fabricated: opening (simulated or actual retrieval of subprimal from vacuum-packed bag), cutting (producing retail cuts), boning (removal of lean trimmings), trimming and scraping (reducing external fat to .32 cm and removal of bone debris), and traying (placing retail cuts on plastic foam trays) as described in Lorenzen et al. (1997). This allowed the calculation of the total estimated time to support labor calculations. Universal Product Code (**U.P.C.**) descriptions (NLSMB, 1995a,b) were used to identify each retail cut derived from each cutting test. All subprimals were weighed before fabrication to ensure that combined ending weights (after the cutting tests) were within 99% of their initial weight, with the difference from 100% being assigned to "cutting loss." However, several bone-in subprimals were fabricated by using a bandsaw and received yields less than 99%, as a result of accumulation of bone dust within the saw. After each cutting test, weights consisting of retail cuts, lean trim, fat trim, bone, and bone dust were recorded by a trained technician using a Toledo scale system.

Fabricated Styles

Veal breast (n = 6), similar to IMPS #313 (NAMP, 1997), yielded boneless brisket (U.P.C. 2729), riblets (U.P.C. 2731), and skirts (U.P.C. 2745).

Veal chucks neck-off (n = 6), similar to IMPS 309, yielded bone-in arm steaks (U.P.C. 2641), blade steaks (U.P.C. 2646), stew meat (U.P.C. 2742), neck bones (U.P.C. 2653), soup bones (U.P.C. 2747), and cubed material (U.P.C. 2740).

Veal neck section (n = 6) yielded neck bones (U.P.C. 2653) and stew meat (U.P.C. 2742).

Veal shoulder roast boneless (n = 6), similar to IMPS 310A, yielded boneless shoulder roast (U.P.C. 2638).

Veal shoulder clod special (n = 6), similar to IMPS 310A, yielded shoulder cutlets (U.P.C. 2652), shoulder roast boneless (U.P.C. 2638), stew meat (U.P.C. 2742), and cubed material (U.P.C. 2740).

Veal blade chuck combo-blade section (n = 6), similar to IMPS 309, yielded blade steaks (U.P.C. 2646), stew meat (U.P.C. 2742), neck bones (U.P.C. 2653), cubed material (U.P.C. 2740), and soup bones (U.P.C. 2747). Veal blade chuck combo-arm roast boneless (n = 6), similar to IMPS 309, yielded boneless arm roast (U.P.C. 2640).

Veal foreshank (n = 6), similar to IMPS 312, yielded cross-cut shanks (U.P.C. 2734), soup bones (U.P.C. 2747), and stew meat (U.P.C. 2742). Veal foreshank center cuts (n = 6), similar to IMPS 312, yielded cross-cut shanks (U.P.C. 2734).

Veal rib (n = 30), similar to IMPS 306, was processed into five cutting styles. Style #1, 7-rib 2 (5 cm) × 3 (7.6 cm) block-ready, yielded rib chops (U.P.C. 2659) and stew meat (U.P.C. 2742). Style #2, 7-rib 4 (10 cm) × 4 (10 cm), yielded rib chops (U.P.C. 2659), short ribs (U.P.C. 2744), and stew meat (U.P.C. 2742). Style #3, 7-rib chop-ready, yielded rib chops (U.P.C. 2659). Style #4, 6-rib block-ready, yielded rib chops (U.P.C. 2659). Style #5, 6-rib chop ready, yielded rib chops (U.P.C. 2659).

Veal loin (n = 18), similar to IMPS 332, was processed into three cutting styles. Style #1, 0 (0 cm) × 1 (2.5 cm) loin special trimmed, yielded loin chops (U.P.C. 2669) and cubed material (U.P.C. 2740). Style #2, 4 (10 cm) × 4 (10 cm) loin kidney fat-in, yielded loin chops (U.P.C. 2669) and cubed material (U.P.C. 2740). Style #3, 4 (10 cm) × 4 (10 cm) loin special trimmed, yielded loin chops (U.P.C. 2669).

Veal sirloin boneless (n = 12) was processed into two cutting styles. Style #1, sirloin (scallopini), yielded sirloin steak boneless, thin material (U.P.C. 2701), and cubed material (U.P.C. 2740). Style #2, boneless sirloin (steaks), yielded boneless sirloin steaks (U.P.C. 2700) and cubed material (U.P.C. 2740).

Veal leg with shank (n = 6), similar to IMPS 334, yielded sirloin steaks (U.P.C. 2699), sirloin tip roast (U.P.C. 2708), rump roast (U.P.C. 2695), heel of round roast (U.P.C. 2711), bone-in round steaks (U.P.C. 2688), cross-cut shanks (U.P.C. 2734), flank steaks (U.P.C. 2746), soup bones (U.P.C. 2747), cubed material (U.P.C. 2740), and stew meat (U.P.C. 2742).

Veal top round (n = 24), similar to IMPS 349, was processed into four cutting styles. Style #1, top round peeled, yielded top round scallopini (U.P.C. 2715), side roast (U.P.C. 2703), and cubed material (U.P.C. 2740). Style #2, top round peeled, yielded top round steaks (U.P.C. 2705), side roast (U.P.C. 2703), end roast (U.P.C. 2704), and cubed material (U.P.C. 2740). Style #3, top round regular, yielded top round scallopini (U.P.C. 2715), side roast (U.P.C. 2703),

Table 1. Mean retail yields, processing times, and SE for veal breast (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2729	Brisket, bnls. ^b	24.6	1.5
2731	Riblets	36.6	2.6
2745	Skirts	1.7	.5
2722	Lean trimmings	10.9	1.3
9990	Fat trimmings	11.6	1.6
9991	Bone	13.4	.8
9999	Cutting loss	1.2	.1
	Total retail yield	73.8	1.5
s			
Processing time			
	Opening	6.2	.9
	Cutting	357.8	25.7
	Traying	22.7	1.4
	Total time	386.7	25.2

^aU.P.C. = Universal Product Code.
^bbnls. = boneless.

and cubed material (U.P.C. 2740). Style #4, top round regular, yielded top round steaks (U.P.C. 2705), side roast (U.P.C. 2703), and end roast (U.P.C. 2704).

Veal bottom round (n = 12) was processed into two cutting styles. Style #1, bottom round (scallopini), yielded eye of round scallopini (U.P.C. 2711), bottom round scallopini (U.P.C. 2714), and cubed material (U.P.C. 2740). Style #2, bottom round (steaks and roast), yielded rump roast (U.P.C. 2695), eye of round steaks (U.P.C. 2719), bottom roast (U.P.C.

Table 2. Mean retail yields, processing times, and SE for veal neck-off chuck (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2641	Arm steaks	20.0	1.2
2646	Blade steaks	41.5	1.7
2742	Stew meat	6.0	.9
2653	Neck bones	4.7	.3
2747	Soup bones	5.1	.3
2740	Cubed steaks	1.5	.2
2722	Lean trimmings	12.2	.5
9990	Fat trimmings	5.7	.3
9991	Bones	2.2	.2
9999	Cutting loss	1.0	.3
	Total retail yield	91.1	.6
s			
Processing time			
	Opening	18.1	3.0
	Cutting	329.6	20.6
	Trimming and scraping	77.8	7.2
	Traying	108.9	10.2
	Total time	534.4	20.9

^aU.P.C. = Universal Product Code.

Table 3. Mean retail yields, processing times, and SE for veal neck section (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2747	Soup bones	17.1	.9
2742	Stew meat	31.1	.8
2722	Lean trimmings	33.5	1.0
9990	Fat trimmings	.7	.7
9991	Bones	17.7	1.5
9999	Cutting loss	0	0
	Total retail yield	81.7	1.1
s			
Processing time			
	Cutting	91.5	5.5
	Traying	3.6	1.0
	Total time	95.1	5.0

^aU.P.C. = Universal Product Code.

2706), bottom round steaks (U.P.C. 2707), and cubed material (U.P.C. 2740).

Veal sirloin tip (n = 12) was processed into two cutting styles. Style #1, sirloin tip (tip steaks, thin; scallopini), yielded tip steaks, thin; scallopini (U.P.C. 2710), and cubed material (U.P.C. 2740). Style #2, sirloin tip (steaks and roast), yielded steaks (U.P.C. 2709) and a roast (U.P.C. 2708).

Veal hindshank (n = 6), similar to IMPS 337, yielded center cuts (U.P.C. 2874) and soup bones (U.P.C. 2747).

Some of the subprimals listed above, when fabricated, also generated lean trimmings, fat trimmings, and bone, which were weighed and recorded for each individual cutting test. Total retail yield was generated by adding all components derived from each cutting test, with the exception of fat trimmings, bones, and cutting loss.

Table 4. Mean retail yields, processing times, and SE for veal shoulder roast boneless (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2638	Shoulder roast, bnls. ^b	100.0	0
9999	Cutting loss	0	0
	Total retail yield	100.0	0
s			
Processing time			
	Opening	3.9	.4
	Cutting	3.5	.4
	Traying	7.8	.7
	Total time	15.2	1.1

^aU.P.C. = Universal Product Code.
^bbnls. = boneless.

Table 5. Mean retail yields, processing times, and SE for veal shoulder clod special (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2652	Shoulder cutlets	50.6	2.4
2638	Shoulder roast, bnls. ^b	33.0	.5
2742	Stew meat	4.0	.8
2740	Cubed material	4.4	1.0
2722	Lean trimmings	4.4	.7
9990	Fat trimmings	3.2	1.0
9999	Cutting loss	.4	.3
	Total retail yield	96.5	1.3
s			
Processing time			
	Opening	4.4	.3
	Cutting	82.7	6.5
	Trimming and scraping	27.4	5.7
	Traying	30.6	1.9
	Total time	145.0	11.2

^aU.P.C. = Universal Product Code.^bbnls. = boneless.

Data Analysis

After fabrication was completed, data were analyzed with JMP (SAS, 1995) to determine means and standard errors on percentage of yields and timing scores for each subprimal. For comparison of styles within subprimal, analysis of variance was performed. When analysis of variance indicated significance ($P < .05$), style means were separated using Tukey's means separation (SAS, 1995).

Table 6. Mean retail yields, processing times, and SE for veal blade chuck combination 1 of 2, blade section (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2646	Blade steaks	56.2	2.1
2742	Stew meat	9.4	1.2
2653	Neck bones	9.3	.3
2740	Cubed material	2.2	.4
2747	Soup bones	5.6	.7
2722	Lean trimmings	11.3	.9
9990	Fat trimmings	4.4	.3
9999	Cutting loss	1.5	.1
	Total retail yield	94.0	.2
s			
Processing time			
	Opening	6.2	.9
	Cutting	203.9	14.1
	Trimming and scraping	26.3	2.3
	Traying	67.7	3.3
	Total time	304.1	15.6

^aU.P.C. = Universal Product Code.

Table 7. Mean retail yields, processing times, and SE for veal blade chuck combination 2 of 2, arm roast boneless (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2640	Arm roast, bnls. ^b	96.7	.6
9990	Fat trimmings	2.6	.9
9999	Cutting loss	.7	.4
	Total retail yield	96.7	.6
s			
Processing time			
	Opening	3.8	.4
	Trimming and scraping	10.6	1.9
	Traying	2.1	.2
	Total time	16.6	2.2

^aU.P.C. = Universal Product Code.^bbnls. = boneless.

Results and Discussion

Tables 1 through 11 report on the retail cuts and associated components from various stand-alone cutting tests, including breast, neck-off chuck, neck section, shoulder roast boneless, shoulder clod special, blade chuck combination consisting of blade section and arm roast boneless, foreshank, foreshank center-cuts, leg with shank, and hindshank. These cuts were evaluated for mean retail yields and processing times because no comparisons were made within cuts. As expected, the data indicate that as the percentage of trimmable bone increases, the total retail yield decreases. Additionally, as the number of retail cuts from subprimals and sections increases, total processing time increases. These cutting tests were performed

Table 8. Mean retail yields, processing times, and SE for veal foreshank (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2734	Osso bucco	41.0	1.8
2747	Soup bones	28.5	2.7
2742	Stew meat	6.2	.5
2722	Lean trimmings	6.8	1.1
9991	Bone	17.0	1.0
9999	Cutting loss	.5	.2
	Total retail yield	82.6	1.1
s			
Processing time			
	Opening	2.3	.1
	Cutting	62.1	2.5
	Traying	12.5	.9
	Total time	76.9	2.9

^aU.P.C. = Universal Product Code.

Table 9. Mean retail yields, processing times, and SE for veal foreshank center-cut (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2734	Osso bucco	99.7	.3
9999	Cutting loss	.3	.3
	Total retail yield	99.7	.3
		s	
Processing time			
	Opening	4.4	.5
	Cutting	15.0	2.5
	Traying	9.2	.7
	Total time	28.6	3.3

^aU.P.C. = Universal Product Code.

in the development of the Veal CARDS program for retailers and food service.

Means and standard errors of various fabrication styles for the percentage of retail yields and processing times for the veal ribs are reported in Table 12. Style #2 had the lowest percentage of total retail yield ($P < .05$) owing to the greatest percentage of trimmable bone and lowest percentage of rib chops ($P < .05$), along with the greatest amount of tail length, which generates a large portion of fat trimmings. Further-

Table 10. Mean retail yields, processing times, and SE for veal leg with shank (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2699	Sirloin steaks, bone-in	16.0	.6
2708	Sirloin tip roast, bnls. ^b	5.6	.6
2695	Rump roast, bnls. ^b	3.8	.2
2711	Heel of round roast, bnls. ^b	8.5	.6
2688	Round steaks, bone-in	22.8	.6
2734	Cross-cut shanks	5.0	.2
2746	Flank steaks	1.1	.1
2747	Soup bones	8.8	.5
2740	Cubed material	1.6	.4
2742	Stew meat	1.6	.3
2722	Lean trimmings	6.4	.3
9990	Fat trimmings	8.6	.6
9991	Bone	8.9	.3
9999	Cutting loss	1.4	.2
	Total retail yield	81.1	.6
		s	
Processing time			
	Opening	11.0	.9
	Cutting	613.3	20.4
	Trimming and scraping	436.0	33.7
	Traying	132.5	7.4
	Total time	1192.9	28.4

^aU.P.C. = Universal Product Code.

^bbnls. = boneless.

Table 11. Mean retail yields, processing times, and SE for veal hindshank (n = 6)

U.P.C. ^a	Retail cut	Mean	SE
		%	
Retail yield			
2874	Hindshank center-cut	46.0	1.2
2747	Soup bones	25.0	1.0
9991	Bone	28.6	.7
9999	Cutting loss	.5	.2
	Total retail yield	71.0	.8
		s	
Processing time			
	Opening	4.5	.2
	Cutting	22.8	.8
	Traying	12.0	1.1
	Total time	39.3	1.5

^aU.P.C. = Universal Product Code.

more, style #2 required the longest total processing time ($P < .05$). Styles #3 and #5 yielded the greatest percentage of total retail yield, the least amount of cutting loss, and the shortest total processing time ($P < .05$). Processing times had an inverse relationship with total retail yield.

The data on retail yields and processing times for veal loins are presented in Table 13. Style #2 had the greatest percentage of fat ($P < .05$), as a result of leaving in the kidney fat before fabrication. Styles #2 and #3 generated more lean and fat trimmings and bone, which resulted in lower percentages of total retail yields than in style #1 ($P < .05$). Differences in total retail yield between styles #2 and #3 are attributable to the greater amount of fat trimming in style #2 ($P < .05$). Fabrication styles #2 and #3 had a greater percentage of bone than style #1 ($P < .05$). Processing times increased for all styles as the percentages of fat and lean trimmings increased ($P < .05$).

Table 14 shows mean retail yields, processing times, and SE for various fabrication styles of veal sirloin tips. Style #1 required more cutting and traying work, which resulted in a much greater total time ($P < .05$), as a result of preparing scallopini vs steaks. The percentages of total retail yields were not different between styles ($P > .05$). Veal sirloin (Table 15) also had higher ($P < .05$) mean cutting, traying, and total processing times for style #1 than for style #2. Although a significant difference between styles #1 and #2 was detected for percentages of total retail yield and cutting loss ($P < .05$), this difference reflects a small sample size.

Mean retail yields, processing times, and SE for different fabrication styles of veal top rounds are presented in Table 16. Style #1 had a greater ($P < .05$) percentage of total retail yield than styles #3 and #4 ($P < .05$), but style #2 did not differ ($P > .05$) from

Table 12. Mean retail yields, processing times, and SE for different fabrication styles of veal rib

U.P.C. ^a	Retail cut	Style #1 (n=6)	Style #2 (n=6)	Style #3 (n=6)	Style #4 (n=6)	Style #5 (n=6)
%						
Retail yield						
2659	Rib chops	87.4 ^c ± 1.4	61.3 ^d ± .8	99.7 ^b ± .2	90.9 ^c ± 1.9	100.0 ^b ± 0
2744	Short ribs	—	15.4 ± 1.2	—	—	—
2742	Stew meat	2.4 ± .8	3.6 ± .6	—	—	—
2722	Lean trimmings	4.8 ^b ± .6	5.5 ^b ± .7	.2 ^c ± .2	4.3 ^b ± 1.1	—
9990	Fat trimmings	1.0 ± .3	1.3 ± .4	—	1.1 ± .4	—
9991	Bone	1.9 ^c ± .5	11.0 ^b ± .9	—	1.1 ^c ± .6	—
9999	Cutting loss	2.6 ^b ± .4	1.9 ^b ± .1	.2 ^c ± .2	2.7 ^b ± .4	0 ^c ± 0
	Total retail yield	94.6 ^c ± .5	85.8 ^d ± 1.2	99.8 ^b ± .2	95.1 ^c ± .9	100.0 ^b ± 0
s						
Processing time						
	Opening	6.82 ^{bc} ± .9	9.3 ^b ± 1.6	5.4 ^c ± .4	5.0 ^c ± .3	5.0 ^c ± .7
	Cutting	54.1 ^c ± 4.8	87.1 ^b ± 7.1	12.9 ^d ± 1.2	51.3 ^c ± 4.3	9.6 ^d ± .8
	Boning	32.2 ^c ± 9.4	107.3 ^b ± 8.4	—	—	—
	Trimming and scraping	88.1 ^c ± 7.7	143.3 ^b ± 9.6	—	65.3 ^c ± 3.8	—
	Traying	38.4 ^{bc} ± 3.2	44.4 ^b ± 2.4	17.4 ^d ± 1.2	34.7 ^c ± 1.9	13.0 ^d ± .6
	Total time	219.5 ^c ± 14.6	391.4 ^b ± 10.8	35.7 ^e ± 2.1	156.3 ^d ± 4.4	27.6 ^e ± .8

^aU.P.C. = Universal Product Code.

^{b,c,d,e}Means within a row lacking a common superscript differ ($P < .05$).

style #1 or styles #3 and #4. Style #2 required the least ($P < .05$) cutting, traying, and total processing times. Styles #3 and #4 were similar ($P > .05$) in intermediate processing times, which left style #3 with the greatest cutting, traying, and total processing times ($P < .05$).

Veal bottom rounds are presented in Table 17 by mean retail yields, processing times, and SE for two different fabrication styles. Even though no difference was seen in percentage of total retail yield ($P < .05$),

all processing times, excluding opening times, were significantly higher for style #1 ($P < .05$). This difference was attributed to fabricating into scallopini for style #1 versus steaks for style #2. This follows the trend noted earlier for veal sirloin tips and sirloins.

In conclusion, fabrication styles that derive bone-in retail cuts generate higher retail yields and lower processing times. This is in agreement with Lorenzen et al. (1997), who stated that as styles are fabricated into semiboneless or boneless, retail yields are

Table 13. Mean retail yields, processing times, and SE for different fabrication styles of veal loin

U.P.C. ^a	Retail cut	Style #1 (n=6)	Style #2 (n=6)	Style #3 (n=6)
%				
Retail yield				
2669	Loin chops	88.7 ^b ± 1.9	64.0 ^d ± 2	72.9 ^c ± 1.7
2740	Cubed material	1.1 ± .7	.6 ± .4	—
2722	Lean trimmings	3.3 ^c ± .8	16.1 ^b ± 1.1	15.5 ^b ± .8
9990	Fat trimmings	2.7 ^c ± .9	14.0 ^b ± .8	5.4 ^c ± .8
9991	Bone	.9 ^c ± .4	3.5 ^b ± .4	3.7 ^b ± .5
9999	Cutting loss	3.2 ± .4	1.9 ± .7	2.5 ± .3
	Total retail yield	93.2 ^b ± .9	80.7 ^d ± 1.1	88.4 ^c ± 1.2
s				
Processing time				
	Opening	5.1 ^c ± .7	14.2 ^b ± 3.4	6.8 ^{bc} ± .6
	Cutting	50.6 ^d ± 2.1	98.1 ^b ± 6.5	70.2 ^c ± 4.6
	Boning	15.5 ^c ± 6.7	102.0 ^b ± 6.1	93.0 ^b ± 6.5
	Trimming and scraping	90.9 ± 10	114.2 ± 10.3	112.5 ± 10.5
	Traying	33.1 ± 1.2	32.7 ± 1.4	33.8 ± 1.7
	Total time	195.1 ^c ± 14.7	361.1 ^b ± 13.2	316.2 ^b ± 13

^aU.P.C. = Universal Product Code.

^{b,c,d}Means within a row lacking a common superscript differ ($P < .05$).

Table 14. Mean retail yields, processing times, and SE for different fabrication styles of veal sirloin tip

U.P.C. ^a	Retail cut	Style #1 (n=6)	Style #2 (n=6)
%			
Retail yield			
2710	Scallopini	52.7 ± 1.2	—
2709	Steaks, bnls. ^b	—	55.0 ± 1.8
2708	Roast, bnls. ^b	—	40.2 ± 1.9
2740	Cubed material	31.4 ± 1.9	—
2722	Lean trimmings	15.3 ^c ± .9	4.3 ^d ± 1.5
9990	Fat trimmings	—	.2 ± .2
9999	Cutting loss	.6 ± .2	.4 ± .2
	Total retail yield	99.4 ± .2	99.5 ± .2
s			
Processing time			
	Opening	3.2 ± .5	3.2 ± .5
	Cutting	233.9 ^c ± 10	33.6 ^d ± 2.3
	Traying	84.3 ^c ± 8.2	28.0 ^d ± 1.8
	Total time	321.3 ^c ± 5.9	64.7 ^d ± 3.8

^aU.P.C. = Universal Product Code.

^bbnls. = boneless.

^{c,d}Means within a row lacking a common superscript differ (*P* < .05).

decreased and processing times are increased. In addition, as total number of retail cuts increases, total processing time increases.

Implications

The results obtained in this study were used to create the standard cutting tests for the Veal CARDS program. Veal CARDS, software that runs with

Table 15. Mean retail yields, processing times, and SE for different fabrication styles of veal sirloin

U.P.C. ^a	Retail cut	Style #1 (n=6)	Style #2 (n=6)
%			
Retail yield			
2701	Scallopini	60.9 ± 3.3	—
2699	Steaks, bnls. ^b	—	69.2 ± 1.4
2740	Cubed material	30.6 ± 4.0	24.6 ± 1.6
2722	Lean trimmings	8.6 ± 2.3	5.3 ± 1.2
9999	Cutting loss	0 ^d ± 0	.9 ^c ± .3
	Total retail yield	100.0 ^c ± 0	99.1 ^d ± .3
s			
Processing time			
	Opening	2.9 ± .4	2.9 ± .4
	Cutting	97.7 ^c ± 7.3	57.6 ^d ± 3.5
	Traying	57.6 ^c ± 6.4	30.7 ^d ± 2.6
	Total time	158.1 ^c ± 10.7	91.2 ^d ± 5.1

^aU.P.C. = Universal Product Code.

^bbnls. = boneless.

^{c,d}Means within a row lacking a common superscript differ (*P* < .05).

Microsoft Windows[®], is capable of evaluating combinations of retail and wholesale product costs, considering the effects of varying labor times and costs, analyzing the effect of case-ready products, scaling results of a single cutting test to that of a major volume purchase, and adjusting retail of subprimal prices to meet specific marketing goals. With the development of Veal CARDS, all major meat species now have a CARDS program for use by the meat retail trade.

Table 16. Mean retail yields, processing times, and SE for different fabrication styles of veal top round

U.P.C. ^a	Retail cut	Style #1 (n=6)	Style #2 (n=6)	Style #3 (n=6)	Style #4 (n=6)
%					
Retail yield					
2715	Scallopini	69.3 ^c ± 1.2	—	54.6 ^d ± 1.1	—
2705	Top round steaks	—	50.7 ^c ± 2.8	—	54.5 ^b ± 1.7
2703	Side roast, bnls. ^b	19.8 ^{cd} ± 1	22.5 ^c ± .7	18.4 ^{cd} ± 1.3	17.8 ^d ± 1.1
2704	Top roast, bnls. ^b	—	23.4 ± 1.5	—	19.6 ± 1.8
2740	Cubed materials	9.3 ^c ± 1.1	3.1 ^d ± 1.4	4.0 ^d ± 1.2	—
2722	Lean trimmings	1.5 ^d ± .4	—	20.6 ^c ± 2.5	5.9 ^d ± 1
9990	Fat trimmings	—	—	2.3 ± .8	2.1 ± .8
9999	Cutting loss	.2 ± .2	.3 ± .2	.1 ± .1	.2 ± .1
	Total retail yield	99.8 ^c ± .2	99.7 ^{cd} ± .2	97.6 ^d ± .7	97.7 ^d ± .7
s					
Processing time					
	Opening	3.3 ± .3	4.3 ± .5	4.1 ± .1	3.6 ± .1
	Cutting	79.3 ^d ± 4.6	23.1 ^c ± 1.6	249.5 ^c ± 20.1	85.3 ^d ± .6
	Traying	57.4 ^c ± 4.6	22.7 ^c ± 1.6	64.3 ^c ± 4.1	35.9 ^d ± .9
	Total time	139.9 ^d ± 7.9	50.0 ^c ± 2.8	317.8 ^c ± 21.1	124.8 ^d ± 6.5

^aU.P.C. = Universal Product Code.

^bbnls. = boneless.

^{c,d,e}Means within a row lacking a common superscript differ (*P* < .05).

Table 17. Mean retail yields, processing times, and SE for different fabrication styles of veal bottom round

U.P.C. ^a	Retail cut	Style #1	Style #2
		(n=6)	(n=6)
		————— % —————	
Retail yield			
2711	Eye scallopini	17.4 ± .7	—
2714	Bottom scallopini	42.8 ± .8	—
2695	Rump roast, bnls. ^b	—	19.3 ± 1.0
2719	Eye round steaks	—	18.9 ± .9
2706	Bottom roast, bnls. ^b	—	21.7 ± .9
2707	Bottom round steaks	—	32.0 ± 1.2
2740	Cubed material	31.5 ^c ± 1.1	4.3 ^d ± .5
2722	Lean trimmings	8.2 ^c ± .6	3.5 ^d ± .5
9990	Fat trimmings	—	.1 ± .1
9999	Cutting loss	.2 ± .1	.3 ± .2
	Total retail yield	99.8 ± .1	99.6 ± .2
		————— s —————	
Processing time			
	Opening	3.8 ± .4	3.8 ± .4
	Cutting	245.2 ^c ± 22.1	84.2 ^d ± 10.9
	Traying	117.1 ^c ± 8.8	48.9 ^d ± 2.3
	Total time	366.0 ^c ± 25.7	136.9 ^d ± 11.3

^aU.P.C. = Universal Product Code.

^bbnls. = boneless.

^{c,d}Means within a row lacking a common superscript differ ($P < .05$).

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