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CANADIAN BEEF GRADING PROGRAM

The Canadian beef grading program compliments Canada's meat inspection program, to form an effective combination for the marketing of Canadian beef. The Canadian beef grading system began in 1929. Since that time, tremendous changes have taken place to the grading system, and it is now regarded to be one of the best in the world.

The Canadian beef grading system fulfils the primary purpose of dividing the population of cattle carcasses into uniform groups to facilitate marketing. The system provides an effective means of describing product that is easily understood by both buyers and sellers. Major changes were introduced to the system in 1992, 1996 and 2001 to more accurately assess beef carcass quality and yield. This system enables buyers, when specifying a grade, to be assured of specific quality and yield information for the particular carcasses to which a grade has been applied. Other than the market segmentation function, grading is also performed for payment purposes to cattle producers.

Approximately 85% of the 3 million Federally-inspected beef carcasses processed in Canada were graded in 2008, although the grading system itself is voluntary. In Canada, beef grading is provided through the Canadian Beef Grading Agency in abattoirs which receive either federal or provincial government meat inspection services. Grade standards and regulations are enforced by Government of Canada (Canadian Food Inspection Agency) employees.

Grade Names - Quality Grades

There are thirteen (13) beef grades in the Canadian system. They are Canada A, Canada AA, Canada AAA, Canada Prime, Canada B1, Canada B2, Canada B3, Canada B4, Canada D1, Canada D2, Canada D3, Canada D4, and Canada E. The four Canada A/AA/AAA/Prime grades are the highest quality Canadian grades and represented 88% of all graded beef in 2008. The four Canada B grades are for youthful carcasses (less than 30 months of age) which do not meet the minimum quality requirements of the Canada A/AA/AAA/Prime grades. They represented 1% of all beef carcasses graded in 2008. The four Canada D grades are essentially cow grades (from mature carcasses) and represented 10% of the total graded carcasses. The E grade is reserved for mature or youthful bull carcasses showing pronounced masculinity and represented 1% of the graded carcasses in 2008. A total of 15% of Canada's total beef carcasses were not graded in 2008. It is important to note that since grading is voluntary, almost half of cow and bull carcasses tend not to be graded.

Quality Grade Criteria

The key grading criteria for the quality grades are carcass maturity, muscling, meat quality, external fat covering, and marbling. For maturity, carcasses are evaluated as either "youthful" or "mature" according to the degree of bone ossification. Youthful carcasses will

have cartilaginous caps on the thoracic vertebrae that are no more than half ossified, and the lumbar vertebrae will show evidence of cartilage or at least as red line present on the tips. Youthful carcasses are produced from cattle generally less than 24 months of age and no more than 30 months of age. Carcasses showing more advanced ossification are considered to be mature and must be graded in one of the Canada D grades or as Canada E in the case of a bull.

Canada A/AA/AAA/Prime Grades

The four high quality grades (A, AA, AAA, Prime) represent 98% of all youthful graded Canadian beef carcasses. The grade criteria for these four grades are identical, with the only exception being degree of marbling. Carcasses must be youthful to be graded in these grades. This ensures a high level of tenderness in all four grades of high quality Canadian beef. Muscling must range from good with some deficiencies, to excellent. The ribeye muscle must have a bright red colour and be firm in texture. There is a minimum external fat thickness of 2 millimetres required at the ribeye measurement site, and the external fat must be firm and white, or no more than slightly tinged with reddish or amber colour. These criteria are identical for all four grades. To distinguish between A, AA, AAA, and Prime graded carcasses, the grader evaluates the level of marbling.

A carcass with youthful characteristics, bright red meat colour, and white fat with at least traces but less than slight marbling will be designated with CANADA A grade (3% of graded youthful carcasses). A carcass with similar characteristics but with a minimum of Slight marbling will be designated with a CANADA AA grade (45% of graded youthful carcasses). A carcass, again with similar high quality characteristics but with a minimum of Small marbling will be designated with a CANADA AAA grade (50% of graded youthful carcasses). A carcass, again with similar high quality characteristics but with a minimum of Slightly Abundant marbling will be designated with a CANADA Prime grade (2% of graded youthful carcasses).

Research completed by Agriculture and Agri-Food Canada (Jones et al, Canadian Journal of Animal Science, 1991, 71:1037-1043) and the United States Department of Agriculture (Wheeler et al, Journal of Animal Science, 1994, 72:3145-3151) indicate that marbling levels explain no more than 5% of the variation in beef palatability (eating quality) traits. This strongly indicates that marbling is not a major influencer of beef quality. This finding further indicates that the eating-quality of Canada A, AA, AAA, and Prime graded beef is uniformly high. The American research found that "USDA quality grade does not sufficiently segregate carcasses for palatability differences, and thus a direct measurement of meat tenderness is needed to supplement USDA quality grades."

Yield Grades

In Canada, all A/AA/AAA/Prime graded carcasses must also be graded for the lean meat yield content in the carcass. This differs from the United States where quality and yield grading are decoupled, and consequently there is no guarantee that both quality and yield

assessments will be made of individual carcasses. Canadian cattle producers wish to encourage a system where producers receive a higher payment for animals which yield more meat for each high quality grade.

There are three possible yield classifications in the Canadian system: Carcasses exhibiting high quality characteristics and are estimated to contain 59% or more lean meat are designated yield classification Canada 1; Carcasses exhibiting the same high quality characteristics and are estimated to contain between 54% and 58% lean meat are designated yield classification Canada 2, and; Carcasses with high quality characteristics and are estimated to contain 53% or less lean meat are designated yield classification Canada 3. The yield grades are not determined for any carcass graded in the B, D, or E grades. The carcass meat yield is predicted using a muscle score and fat score. To enable the grader to estimate the carcass meat yield quickly, a special ruler has been developed by Agriculture and Agri-Food Canada which scores length and width of the ribeye and external fat thickness over the ribeye.

Canada B Grades

The Canada B1 graded carcass has the same criteria as an A/AA/AAA/Prime graded carcass, except that it has less than traces of marbling and/or it has less than 2 millimetres of external fat over the ribeye. The Canada B2 grade is given to youthful carcasses that have yellow exterior fat. The Canada B3 grade is given to youthful carcasses that have deficient muscling. The Canada B4 grade is given to youthful carcasses that have dark coloured meat.

Canada D Grades

The D grades are for mature carcasses and are normally referred to as cow or commercial grades. The Canada D1 grade is given to mature carcasses with excellent muscling and external fat characteristics. The CANADA D2 grade is given to mature carcasses that exhibit weaker muscling and have poorer external fat characteristics such as yellow fat. The CANADA D3 grade is given to mature carcasses that have deficient muscling. The CANADA D4 grade is given to mature carcasses with more than 15 millimetres of external fat over the ribeye.

Canada E Grade

The CANADA E grade is given to either youthful or mature carcasses of bulls or stags that exhibit pronounced masculinity.

Boxed Beef Grade Monitoring Program

The Canadian beef exporting industry has largely moved away from sales of carcass beef, toward the sale of boxed beef. One danger in moving into a boxed beef program is the potential loss of grade identity for a particular carcass. Canada, in an effort to address this

issue of grade identification to the sub-primal "cut beef" level, included the compulsory monitoring of grade identification to the boxed beef level. All Canadian boxed beef product distributed domestically or exported by federally inspected Canadian establishments must carry a grade identity or be marked as ungraded. This identification system is monitored by Canadian Beef Grading Agency employees. The key benefit to this program is that the buyer can be confident that the product within the box bears the grade for the carcass from which it was derived.

COMPARISONS TO THE U.S.D.A. (American) GRADING SYSTEM

The Canadian marbling standards were changed in 1996. Today, we use the copyrighted standards used in the United States. The minimum marbling standards used for USDA Prime (slightly abundant), Choice (small), and Select (slight) are the same standards used in Canada to segregate the youthful quality carcasses into Canada Prime, AAA, and AA respectively. Canada A has no comparable USDA grade. Canada A is restricted to youthful quality carcasses that have at least traces less than slight marbling.

To establish the degree of similarity in assignment of beef quality grades in the USA and Canada, two studies were conducted in 1994 on over 4,600 carcasses in the two countries. The studies were conducted by the National Grade Standards Officers of both countries who assessed each of the 4,600 carcasses independently and assigned a final quality grade to the carcass. This study showed that there is a high degree association (approximately 85%) between the marbling standards of the Canadian and American high quality beef grades. It is important to note that since this study, Canada adopted the copyrighted USDA standards for slight, small, and slightly abundant marbling.

Canada's grade classification is hierarchic in nature. Canada has muscling, colour, and fat colour and cover minimum requirements for our four quality grades. Quality factors in the United States are weighted and one factor may be able to compensate for a deficiency in another factor. The Canadian grading system allows no "quality attribute offsets."

The American system will allow carcasses from animals up to 42 months of age (B age category) to stay in their Prime, Choice, and Standard grades, if the carcasses show higher levels of marbling. The Canadian grading system will automatically remove all Mature animals (over 30 months of age - based on physiological criteria) from the four high quality grades (A/AA/AAA/Prime) to either the "D" or "E" grades.

The American system will penalize black cutter (black colour) beef by no more than one full grade (ie. Prime to Choice, Choice to Select, or Select to Standard). Dark cutter (dark colour) beef will be discounted by less than one full grade (ie. High Choice to Low Choice). It is therefore possible for dark coloured beef to be graded Choice, Select, or Standard in the United States. The Canadian grading system will automatically remove all dark cutter beef from the four high quality grades (A/AA/AAA/Prime) to the B4 grade.

The American system does not recognize yellow fat as a quality discount factor. The Canadian grading system will automatically remove all carcasses with yellow fat from the four high quality grades (A/AA/AAA/Prime) to the B2 grade.

The American system does not have a minimum muscling requirement for its top grades. The Canadian grading system will automatically remove all carcasses with poor muscling from the four high quality grades (A/AA/AAA/Prime) to the B3 grade.

The American system will allow moderately firm textured beef in the USDA Prime grade, slightly firm textured beef in the USDA Choice grade, slightly soft textured beef in the USDA Select grade, and soft textured beef in the USDA Standard grade. The Canadian grading system will allow only firm textured beef into the four high quality grades (A/AA/AAA/Prime). The Canadian grading system will automatically remove all carcasses with less than firm texture from the four high quality grades (A/AA/AAA/Prime) to the B grades.

The level of marbling in Canada Prime includes the marbling levels in the American Prime. The level of marbling in Canada AAA includes the marbling levels in the American Choice grade. The level of marbling in Canada AA includes the marbling levels in the American Select Grade. Although the level of marbling in Canada A includes the upper- marbling levels in the American Standard grade, the USDA Standard grade is not considered a high-quality grade due to numerous quality defect allowances.

The American grading system uses 5 yield classifications (Y 1-5). The Canadian grading system uses three yield classifications (Canada 1-3). The Canadian beef packing industry will discount all carcasses falling in the Canada 3 category, which is equivalent to the American Y 3-5 categories. The American beef packing industry generally discounts carcasses falling in their Y 4-5 categories. This indicates that the Canadian grain-fed cattle are encouraged to be higher yielding (less exterior and seam fat) than American grain-fed cattle. This is achieved through consistently high quality cattle genetics, environment, and feeding systems.

CONCLUSION

In conclusion, the Canada Prime grade is virtually identical to the U.S.D.A. Prime grade, except that the Canadian grade does not allow dark coloured meat, yellow fat, older animals, or other off-quality characteristics. The Canada AAA grade is virtually identical to the U.S.D.A. Choice grade, except that the Canadian grade does not allow dark coloured meat, yellow fat, older animals, or other off-quality characteristics. The Canada AA grade has comparable marbling to the U.S.D.A. Select grade, but again the Canadian grade does not allow dark coloured meat, yellow fat, or other off-quality characteristics. The Canada A grade is unique to Canada in that there is less marbling but all other quality attributes are still present. This particular grade is well suited to those consumers now wishing to limit their level of fat intake while still wishing to enjoy the eating experience of high quality grain-fed beef.

The Government of Canada (Canadian Food Inspection Agency), in consultation with the Canadian beef industry, is constantly reviewing regulations to ensure that the safety and marketability of Canadian beef is maintained and improved. A consultation mechanism is in place which permits input from all sectors of the industry with regard to concerns about the inspection and grading systems.

March 2009

SPECIFICATIONS FOR CANADA'S BEEF CARCASS GRADING REGULATIONS

IMPLEMENTED: APRIL 5, 1992

GRADE	MATURITY CLASS	CARCASS YIELD	LONGISSIMUS MUSCLE (RIBEYE)			FAT COVERING				MUSCLING VISUAL APPRAISAL	ROLLER BRAND COLOUR				
			MARBLING ²	COLOUR	TEXTURE	FAT LEVEL MM ³	COLOUR	TEXTURE	DISTRIBUTION						
Prime	I Youthful	CANADA 1: ≥ 59%	At least Slightly Abundant	Bright Red	Firm	≥ 2	White or slightly tinged with reddish or amber	Firm	No Specification	Good, to excellent with some deficiency	Red				
AAA			At least Small												
AA		CANADA 2: 54-58%	At least Slight, but less than Small												
A			CANADA 3: ≤ 53%									At least Trace, but less than Slight			
B1	I Youthful	No Specification	No Specification	Bright Red	Firm	No Specification	Same as Grade "A"	Firm	No Specification	Same as Grade "A"	Blue				
B2												No Specification	Yellow	No Specification	Deficient to excellent
B3				Same as Grade "A"	Deficient to good										
B4				Dark Red	White to Yellow		Deficient to excellent								
D1	II Mature	No Specification	No Specification	No Specification	No Specification	< 15	Same as Grade "A"	Firm	Extends well over the ribs and loins and moderately well over the hips and chucks	Excellent	Brown				
D2												White to yellow	Firm to Slightly soft	Extends moderately well over the ribs and loins and lightly over the hips and chucks	Medium to excellent
D3												No Specification	No Specification	No Specification	No Specification
D4						Deficient to excellent									
E	I Youthful or II Mature	No Specification	No Specification	No Specification	No Specification	No Specification	No Specification	No Specification	No Specification	Carcass of a bull or stag Pronounced masculinity	Brown				

1. The yield, in respect of a carcass, means the estimated percentage lean meat in the carcass derived from the primal cuts. These yield grades are stamped on Canada A, AA, AAA, and Prime graded carcasses.
2. Marbling means the amount, size, and distribution of intramuscular fat deposits in the longissimus muscles of a carcass that have been exposed by knife-ribbing.
3. Fat level means the fat measurement at the minimum point of thickness in the fourth quadrant of the longissimus muscle between the 12th and 13th ribs.

CANADIAN VEAL GRADING PROGRAM

Youthful bovine carcasses, weighing less than 160 kilograms (hide off), are classified as veal within the Canadian beef grading program. Veal carcasses are graded for quality on the basis of meat colour, overall muscling, and fat cover.

Veal carcasses with at least good muscling and some creamy white fat are graded CANADA A. Those with low to medium muscling and an excess of fat cover are graded CANADA B. Veal carcasses failing to meet the requirements of CANADA B are graded CANADA C.

All veal carcasses are then graded for meat colour. The veal grader uses a *Hunter Lab* colour metre to do this. The carcasses are assigned a numerical value based on the objective measurement of meat colour. Veal carcasses are segregated into four colour classifications, based on these metre reading values. The bright pink or lighter colour range is given a grade of 1. As meat colour becomes more pink or red, grades of 2, 3, and 4 are assigned. This scientific method of assessing meat colour is being continually refined. Research is now underway to develop a meat probe that will directly measure the level of meat pigment, which is the base of all colour analysis. Should this method of colour determination be judged superior to the current methods, this new technology will be adopted.

As indicated in the above analysis, the top quality of Canadian veal is produced from carcasses grading A1. As muscle and back fat quality decreases, muscling scores will move to B and then C. As meat colour becomes more intensely pink or red, the colour scores will move to 2, 3, or 4. The lowest quality of Canadian veal is therefore produced from carcasses grading C2. This process of muscle and colour grading ensures that purchasers of Canadian veal can specify their exact quality requirements.