

BEEF CARCASS GRADING STANDARD

JAPAN MEAT GRADING ASSOCIATION

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YIELD SCORE

Yield score is determined by estimated percentage by the multiple regression equation, which includes four carcass measurements. Most measurements are obtained on the 6th to 7th rib section, as shown in the figure of ribbed carcass. Rib eye area is measured by grid and others are by scale. An additional measurement for the equation, the left side weight, is obtained from routine records.

EQUATION FOR YIELD ESTIMATION

$$\begin{aligned} \text{Estimated percentage (\%)} = & 67.37 + (0.130 \times \text{Rib eye area cm}^2) \\ & + (0.667 \times \text{Rib thickness cm}) \\ & - (0.025 \times \text{Cold left side weight kg}) \\ & - (0.896 \times \text{Subcutaneous fat thickness cm}) \end{aligned}$$

NOTE: Add 2.049 for Wagyu carcass.

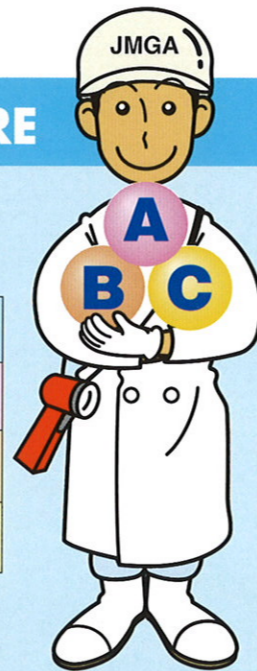
Yield score may be reduced by one rank, if the intermuscular fat thickness is rather thick compared to left side weight and rib eye area or if round is too thin and the proportion of fore and hind quarters is apparently undesirable.

CLASSIFICATION OF YIELD SCORE

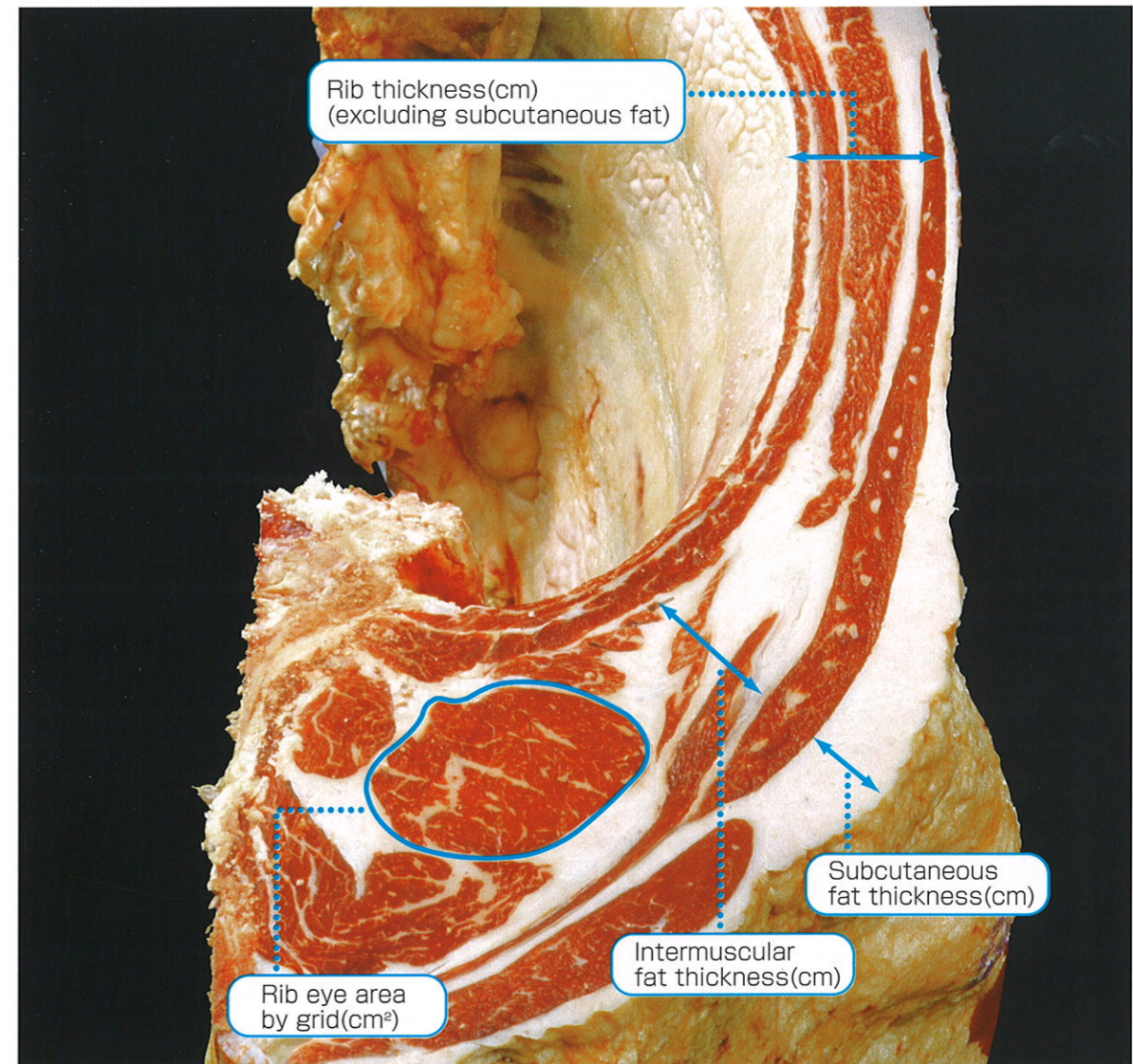
Yield score is classified into 3 grades, A, B and C as follows:

Grade	Yield estimated percentage	Specification
A	72% and above	Yield of total cuts is above average range
B	69% and above, and under 72%	Average
C	Under 69%	Below average range

Yield average value is determined so as to normally distribute around B rank.



CARCASS MEASUREMENTS ON THE 6TH TO 7TH RIB SECTION



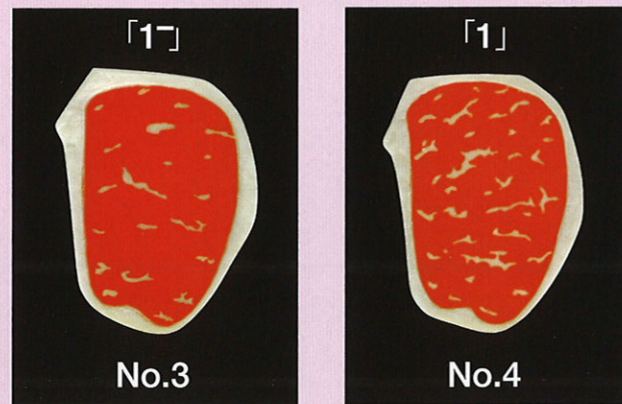


Meat quality score is determined in terms of beef marbling, meat color and brightness, firmness and texture of meat, color, luster and quality of fat.

1 BEEF MARBLING

According to the results of a market survey on carcass distribution by the degree of marbling, the majority were classified in the range of "1⁻ to 1". This range was regarded as "Grade 3" and about 40% of marketed carcasses were included in this grade. Then, beef marbling was divided into 5 grades so as to center around the "Grade 3". As a result of this revision, the minimum requirement of beef marbling for each grade is more fairly rearranged than in the previous grading system. In this grading standard, twelve standards of Beef Marbling Standard (B.M.S.) showing continuous change of the degree of marbling are adopted.

●AVERAGE BEEF MARBLING (GRADE 3)



●CLASSIFICATION OF BEEF MARBLING GRADE

Grade	Evaluation Standard	BMS No.
5	Excellent	2 ⁺ and above
4	Good	1 ⁺ to 2
3	Average	1 ⁻ to 1
2	Bellow Average	0 ⁺
1	Poor	0

The relationship between beef marbling evaluation and classification of grade is as follows:

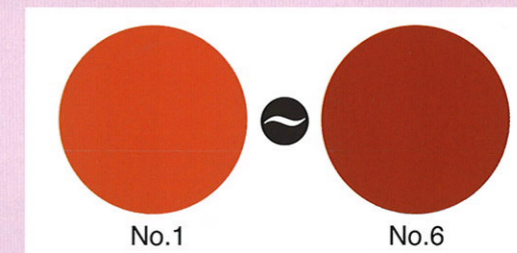
THE RELATIONSHIP BETWEEN BEEF MARBLING EVALUATION AND CLASSIFICATION OF OLD AND NEW GRADE

B.M.S. No.	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	No.11	No.12
Evaluation Standard	0	0 ⁺	1 ⁻	1	1 ⁺	2 ⁻	2	2 ⁺	3 ⁻	3	4	5
Classified Grade	1	2	3	4			5					

2 COLOR AND BRIGHTNESS OF MEAT

In this item, meat color is evaluated by Beef Color Standard (B.C.S.) prepared as seven continuous standards. Average color range is from No.1 to No.6 of B.C.S. No. and carcasses in this color range can be graded in "Grade 3" or upper grades. Brightness of meat is evaluated by visual appraisal. At the final decision of grade of this item, both factors are considered.

●AVERAGE MEAT COLOR RANGE (GRADE 3 and above)



●CLASSIFICATION OF COLOR AND BRIGHTNESS GRADE

Grade	Color B.C.S. No.	Brightness
5	No.3~No.5	Very Good
4	No.2~ No.6	Good
3	No.1~ No.6	Average
2	No.1~ No.7	Below Average
1	A Grade Except 5~2	



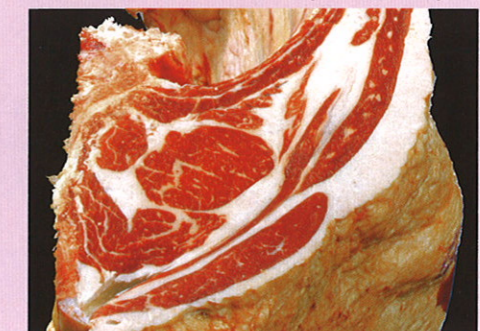
3 FIRMNESS AND TEXTURE OF MEAT

For this item, two factors are evaluated by visual appraisal and they are classified into five grades. At the decision of the final grade of the item, both factors are considered.

●CLASSIFICATION OF FIRMNESS AND TEXTURE GRADE

Grade	Firmness	Texture
5	Very Good	Very Fine
4	Good	Fine
3	Average	Average
2	Below Average	Below Average
1	Inferior	Course

●AVERAGE FIRMNESS AND TEXTURE OF MEAT (GRADE 3)





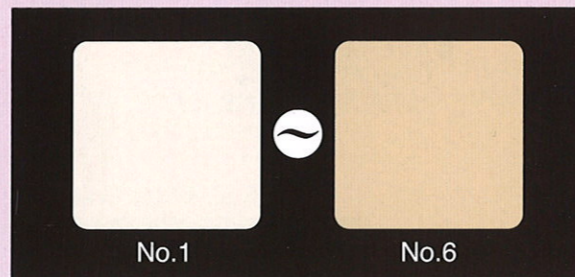
4

COLOR, LUSTER AND QUALITY OF FAT

One of the factors in this item, fat color is evaluated by Beef Fat Standard (B.F.S.) prepared as seven continuous standards. Average color range is from No.1 to No.6, and carcass in this color range can be graded as "Grade 3" or upper grades.

The remaining two factors, luster and quality are evaluated simultaneously by visual appraisal. Three factors are considered in the decision of the final grade of the item.

●AVERAGE FAT COLOR RANGE (GRADE 3 and above)



●CLASSIFICATION OF FAT COLOR, LUSTER AND QUALITY GRADE

Grade	Fat Color	B.F.S. No.	Luster and Quality
5	Excellent	No. 1~No.4	Excellent
4	Good	No. 1~No.5	Good
3	Average	No. 1~No.6	Average
2	Below Average	No. 1~No.7	Below Average
1	Inferior	A Grade Except 5~2	

DETERMINATION OF OVERALL MEAT QUALITY SCORE

Overall meat quality score is graded down to the lowest grade among following the four items

Overall Meat Quality Score	3
Beef Marbling	4
Color and Brightness	4
Firmness and Texture	3
Fat Color, Luster and Quality	4



STAMPING OF YIELD AND MEAT QUALITY SCORE ON CARCASS

Final yield and carcass quality scores are indicated on carcasses by one class of the 15 combinations.

●DIVISION OF CLASSES

Yield Score	Meat Quality Score				
	5	4	3	2	1
A	A5	A4	A3	A2	A1
B	B5	B4	B3	B2	B1
C	C5	C4	C3	C2	C1

●EXAMPLE OF A CLASS STAMP



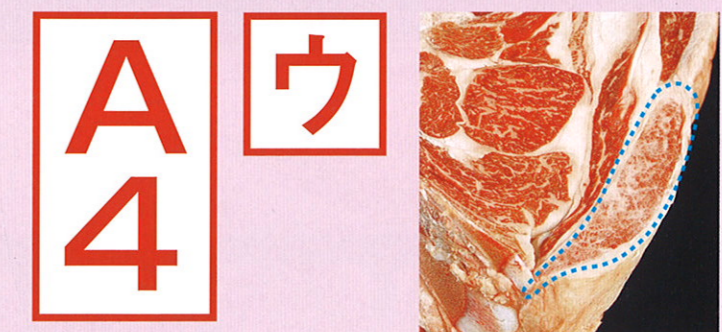
DAMAGE INDICATION BY SUPERScript STAMP

A carcass which is recognized to have any damage is stamped with a superscript mark classified according to the type of damage.

●CLASSIFICATION OF THE TYPE OF DAMAGE

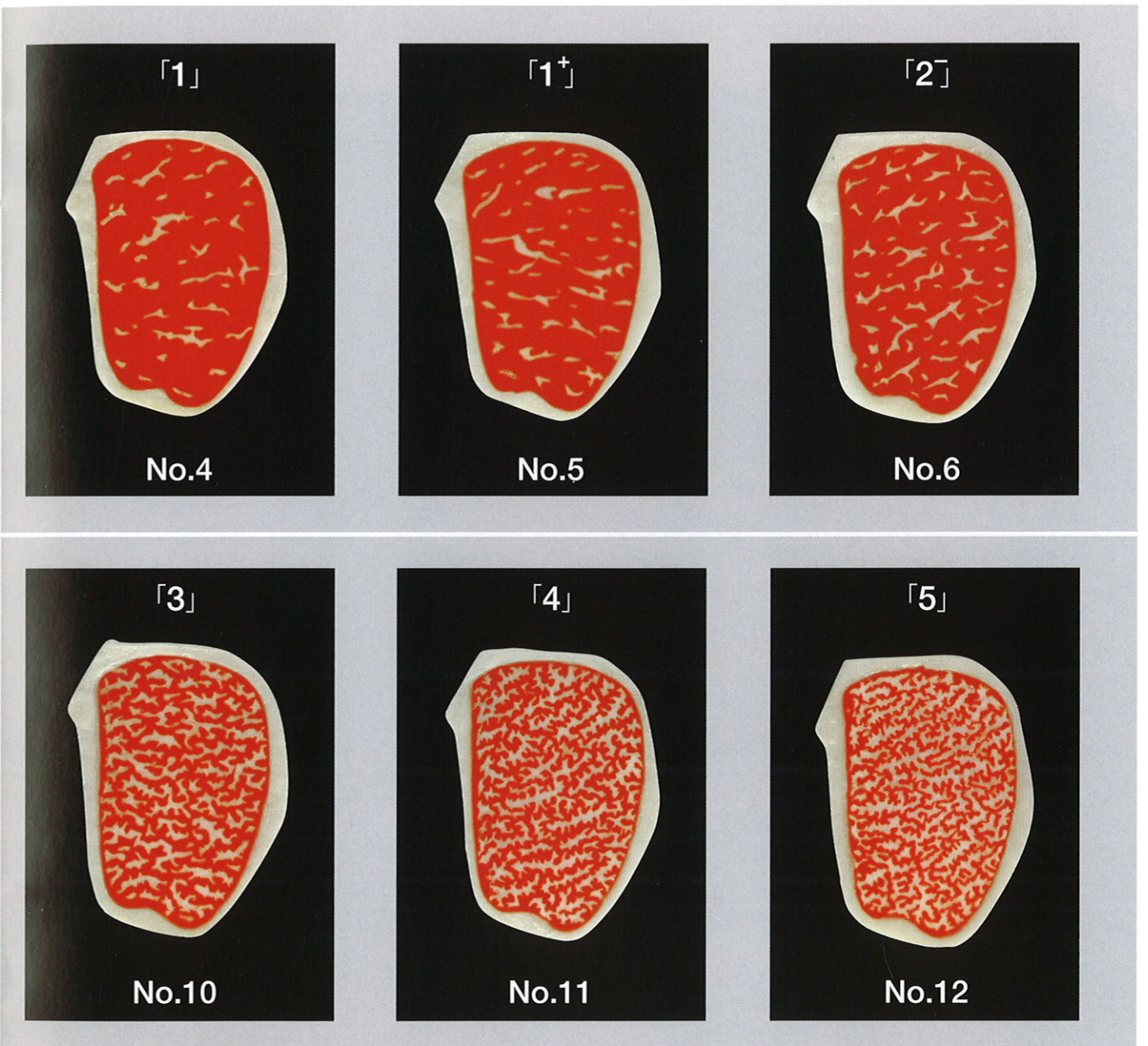
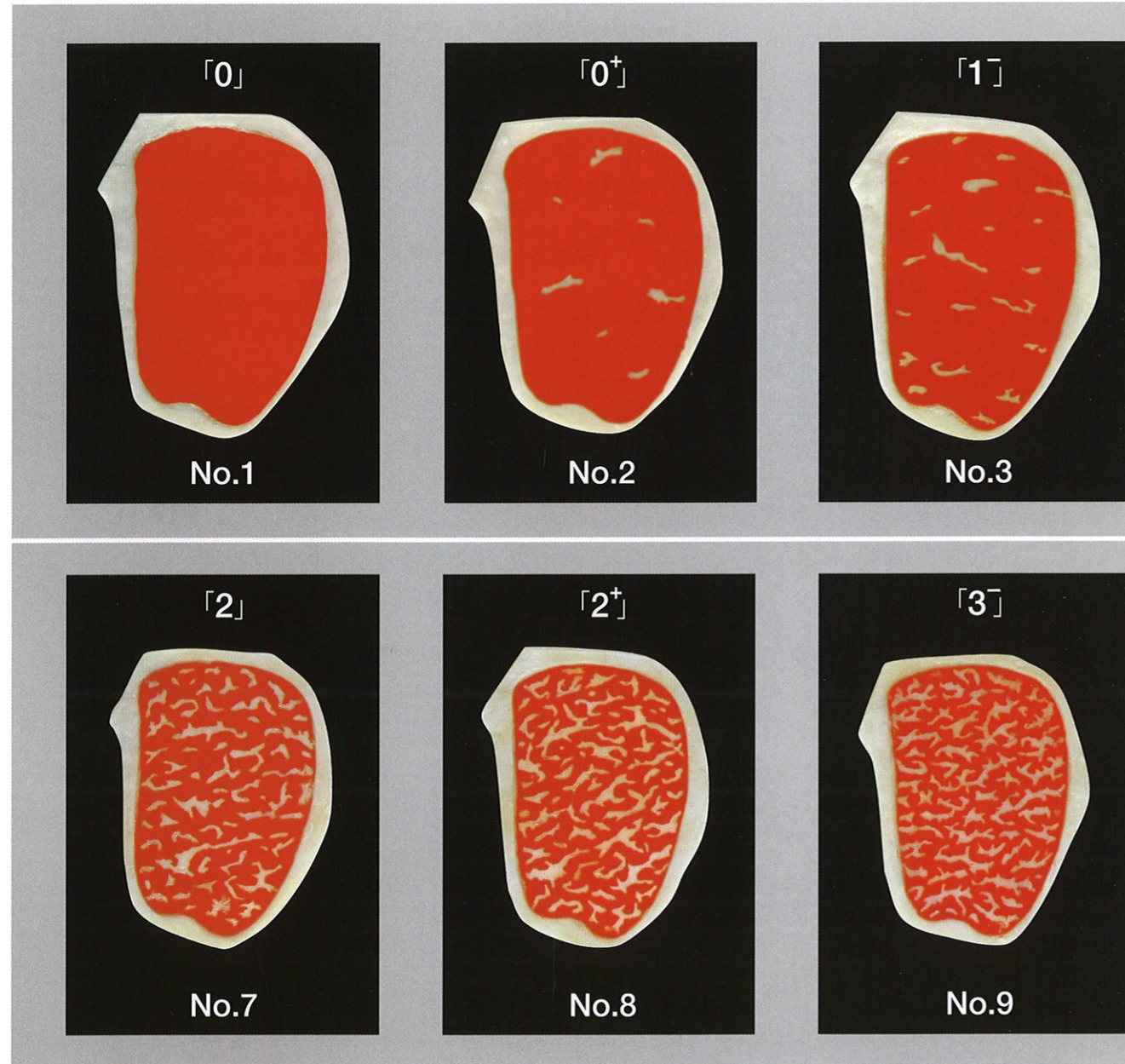
Type of Damage	Mark
Muscle Bleeding (Stain)	ア (A)
Muscle Edema	イ (I)
Inflammation of Muscle	ウ (U)
External Wound	エ (E)
Part Missing	オ (O)
Other	カ (KA)

●EXAMPLE OF A DAMAGE INDICATION Inflammation of Muscle

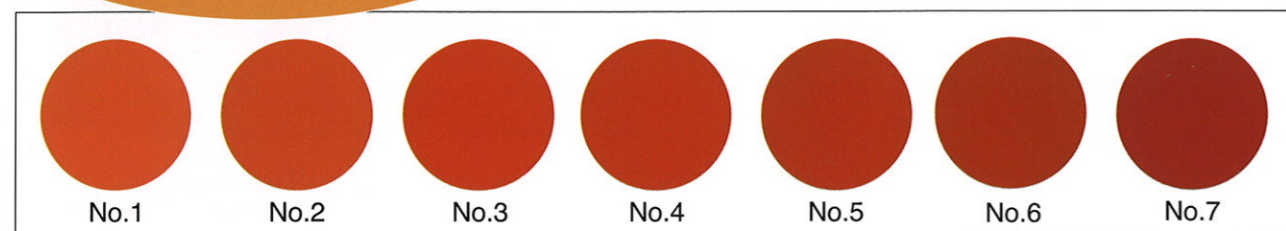


BEEF MARBLING STANDARD (B.M.S.)

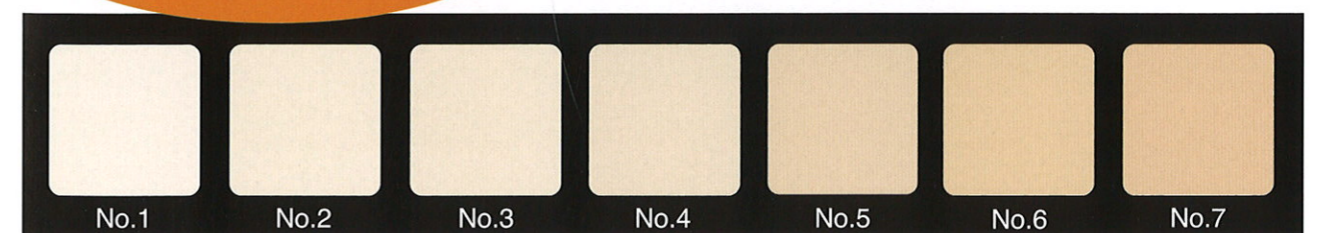
Silicone resin models are newly introduced for the evaluation of beef marbling, meat color and fat color. These models were developed by the National Institute of Animal Industry to standardize the range of the degree of marbling, meat color and fat color, according to their physical characteristics.



BEEF COLOR STANDARD (B.C.S.)



BEEF FAT STANDARD (B.F.S.)



CARCASSES

The grading of meat animal carcasses is managed by the "Japan Meat Grading Association", in the meat wholesale markets and at the meat centers established in major producing areas, throughout Japan.

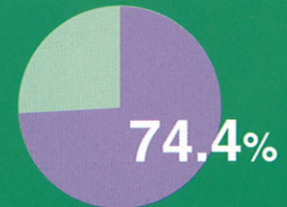
The grading is implemented according to the carcass grading standard for beef and pork, established by the association, under the approval by Minister for Agriculture, Forestry and Fisheries.

Graded carcasses in 1999 (January-December) were 985,000 head or 74.5% of the total slaughtered cattle.

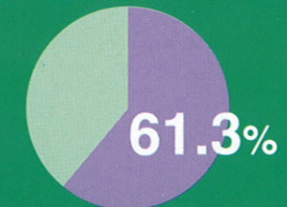
With regard to pork carcasses, 10,345,000 head were graded, accounting for 61.3% of the total slaughtered pigs.

Grading of carcasses plays an important role in the establishment of appropriate prices for production and for the rationalization of distribution channels.

◎Graded carcasses

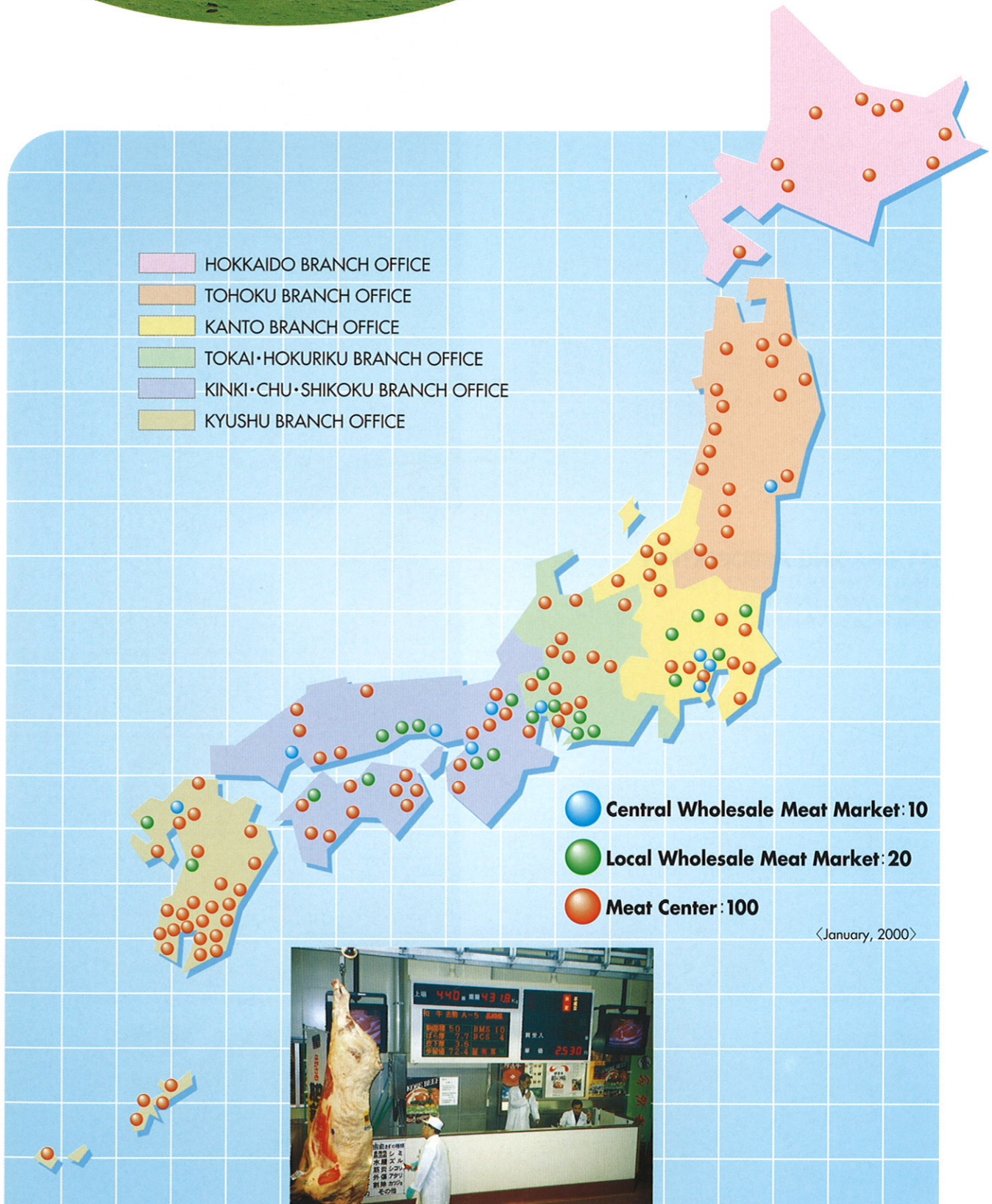


◎Pork carcasses



The location of Branch Offices and Operation offices

- HOKKAIDO BRANCH OFFICE
- TOHOKU BRANCH OFFICE
- KANTO BRANCH OFFICE
- TOKAI·HOKURIKU BRANCH OFFICE
- KINKI·CHU·SHIKOKU BRANCH OFFICE
- KYUSHU BRANCH OFFICE



<January, 2000>