

## Nutrition and Japanese Beef

Scientists agree that a bad diet consists of ultra-processed and starchy foods like processed meat, potato chips, French fries, and white bread, along with drinks rich with sugar.

Scientists recommend a diversity of diets, i.e., they do not agree on what a good diet is. We believe a good diet is one which achieves a balance in all ingredients, includes fermented foods, whilst avoiding factory processed goods.

Beef is contentious, as it is a red meat (pork, lamb, veal, beef) and the scientific recommendation is to limit red meats. For example, the world-renowned Cleveland Clinic recommends limiting red meat to one to two meals a week, to about 170 grams in total <sup>(1)</sup> The World Cancer Research Fund International is more lenient, recommending per week a limit of three (larger) portions, to about 350 to 500 grams in total <sup>(2)</sup> The U.K. NHS recommends a daily limit of 70 grams (equivalent to 490 grams a week). <sup>(3)</sup>

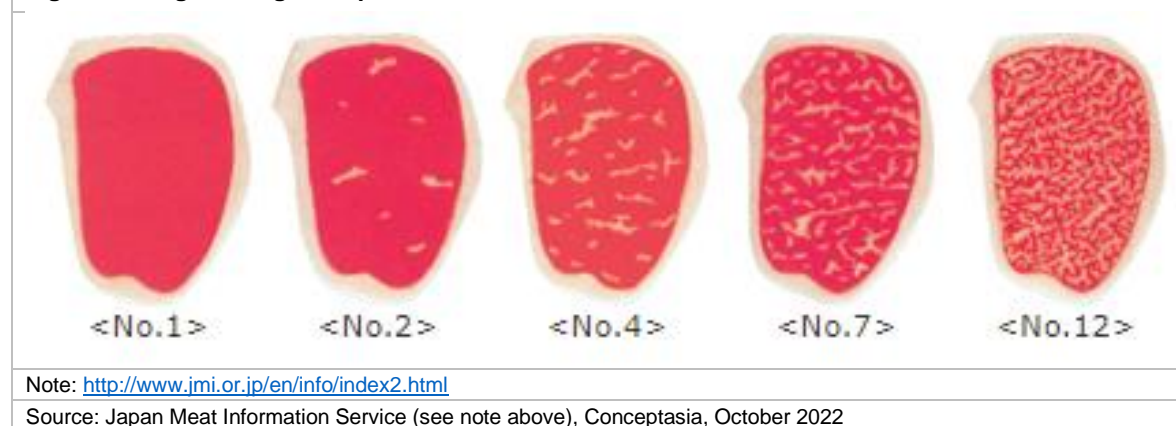
If you are eating red meat, this still leaves room for choices. Beef is essentially protein with varying quantities of fat. We recommend considering Japanese beef for its relatively superior fat profile.

## Japanese Beef

Wagyu is a Japanese word that means “Japanese beef”. However, the word has passed into more global usage, and is now also used as follows. *Wagyu cattle includes four Japanese breeds; Black, Brown, Shorthorn, and Polled. Today, the renowned brand name Wagyu includes not only cattle produced in Japan, but also cattle produced in countries such as Australia and the United States.* <sup>(4)</sup>

The Japanese have taken beef labelling to a further stage that includes the degree of marbling of the beef, its color, along with the source of production. The grading system assigns both a yield grade (A, B, C) and a meat quality grade (1 to 5). A5 is the top grade.

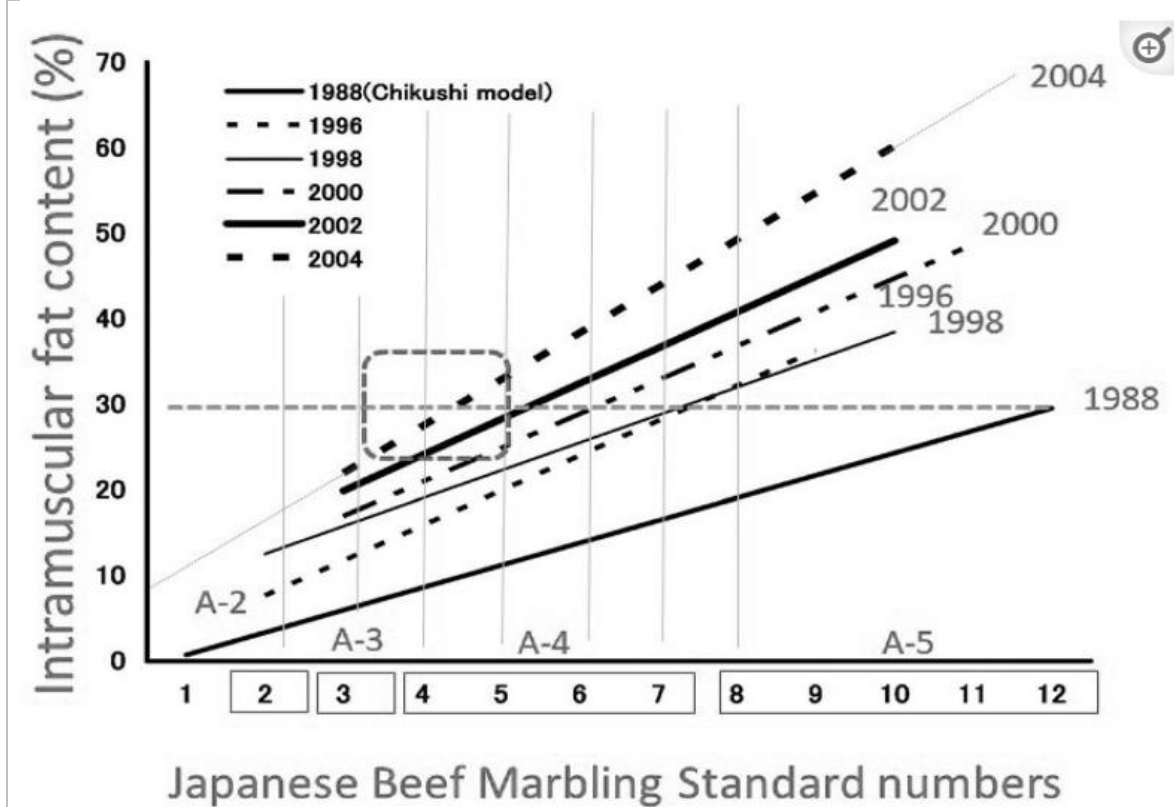
**Fig.1 Marbling Grading Examples**



Marbling reflects abundant intra-muscular fat cells throughout the meat. This creates a buttery, Umami texture. The intra-muscular fat ratio of Japanese black cattle is now over 30%, and sometimes as high as 60%. By way of comparison, USDA (United States Department of Agriculture) Certified Prime beef needs to have 6-8% marbled fat.

The marbling requirements to meet Japanese beef labelling standards have been progressively increasing, Fig.2.

**Fig.2 Japanese Beef Marbling Standards and Intramuscular Fat Content**



Note: Relationship between Japanese beef marbling Standard numbers and intramuscular lipid in *M. longissimus thoracis* of Japanese Black steers from 1996 to 2004, by Horii H, Sakurai Y, Kanbe Y, et al. 2009, (in Japanese)

Source: *The Japanese Wagyu beef industry: current situation and future prospects – A review* <sup>(4)</sup>, modified from the original in the report in the note above, Conceptasia, October 2022

**Fig.3 Cattle Raised for Beef Production in Japan, 2017**

<i>Wagyu Breeds</i>	
Japanese black cattle *	1,600,000 approx.
Japanese brown cattle	21,000
Other Wagyu breeds	25,000
<i>Non-Wagyu Breeds</i>	
Holstein	313,000
F1 Wagyu-cross	521,600
Others	100
<b>Overall Total</b>	<b>2,500,000 approx.</b>

Note: \* There are several strains of black cattle, the most prestigious being the Tajima breed. The Japanese word for black cattle breed beef is *kurage*.

Note: Ministry of Agriculture, Forestry and Fisheries, Statistics VIII. Livestock and poultry: number of farm households feeding livestock and number of livestock fed etc., <http://www.maff.go.jp/e/data/stat/90th/index.html#3>, quoted in <sup>(4)</sup>

Source: Ministry of Agriculture, Forestry and Fisheries (see note above), Conceptasia, October 2022

		<b>Source Prefecture</b>	<b>Comments</b>
1.	Kobe beef	Hyogo	Tajima cattle
2.	Matsuzaka beef	Mie	Tajima cattle. The source of beer drinking cow stories
3.	Omi beef	Shiga	Tajima cattle. Miso marinated Omi beef presented to 16 <sup>th</sup> century Shoguns
4.	Iwate shorthorn	Iwate	Shorthorn is a rare breed. Lean beef
5.	Yonezawa beef	Yamagata	High levels of fat
6.	Hitachi beef	Ibaraki	Feed includes barley
7.	Kazusa beef	Chiba	Iodine-rich water
8.	Kyoto beef	Kyoto	
9.	Miyazaki beef		Popular export
10.	Kumoto Akanshi	Kumamoto	Brown cattle breed. Well known roast beef
Notes: Shading, top three brands. For more details, please see: <a href="https://savorjapan.com/contents/discover-oishii-japan/the-perfect-guide-to-high-quality-japanese-wagyu-beef-brands-history-regions-restaurants-and-more/">https://savorjapan.com/contents/discover-oishii-japan/the-perfect-guide-to-high-quality-japanese-wagyu-beef-brands-history-regions-restaurants-and-more/</a>			
Source: Savor Japan (see note above), Conceptasia, October 2022			

## Health benefits of Japanese beef

Importantly, the Wagyu breed produces carcass lipids containing relatively higher concentrations of mono-unsaturated fatty acids (MUFA).<sup>(5, 6, 7)</sup> These are otherwise known as “good” fat and act to lower cholesterol.<sup>(8, 9, 10)</sup> The human body uses MUFA for energy and cell growth.

Fat has been reported as having fewer adverse effects on health than carbohydrates, especially simple carbohydrates.<sup>(4, 11)</sup>

Beef is an important source of proteins, which are important for human health including keeping blood vessels flexible and in the prevention of cerebrovascular disease. Beef protein contains all of the nine essential amino acids that enable the growth and maintenance of the human body. The amino acid profile of beef is almost identical to that of human muscles.

An adequate protein intake also enhances our immune system.<sup>(4, 12)</sup>

Food containing high-quality protein rather than carbohydrates is also desirable for health.<sup>(4, 13)</sup>

Beef contains many vitamins and minerals, including Vitamin B12, Zinc, Iron, selenium, phosphorus, Vitamin B3 (Niacin), and Vitamin B6. The benefits of each of these is detailed in “Beef 101: Nutrition Facts and Health effects”.<sup>(14)</sup>

## Cooking and Condiments

Steaming, boiling, and stewing beef are the healthier cooking methods.<sup>(14)</sup>

Common condiments are soy sauce, salt and pepper. Please do not consume too much salt.

## References

- 1) *Is Red Meat Bad for You?* by Cleveland Clinic: <https://health.clevelandclinic.org/is-red-meat-bad-for-you/>
- 2) *Limit Red and Processed Meat*, by The World Cancer Research Fund International: <https://www.wcrf.org/diet-activity-and-cancer/cancer-prevention-recommendations/limit-red-and-processed-meat/#:~:text=Dietary%20goal,%2C%20if%20any%2C%20processed%20meat.>
- 3) *Meat in your Diet*, by the NHS: <https://www.nhs.uk/live-well/eat-well/food-types/meat-nutrition/>
- 4) *The Japanese Wagyu Beef Industry: current situation and future prospects — A review*, by Takafumi Gotoh, Takanori Nishimura, Keigo Kuchida, and Hideyuki Mannen, June 2018
- 5) *Effect of breed type and sex on the fatty acid composition of subcutaneous and intramuscular lipids of finishing steers and heifers*, by Zembayashi M, Nishimura K, Lunt DK, Smith SB., 1995
- 6) *Fatty acid composition of subcutaneous and intramuscular adipose tissues and M. longissimus dorsi of Wagyu cattle*, by Sturdivant CA, Lunt DK, Smith GC, Smith SB., 1992
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- 13) *High-protein, low-fat diets are effective for weight loss and favorably alter biomarkers in healthy adults*, by Johnston CS, Tjonn SL, Swan PD., 2004
- 14) *Beef 101: nutrition Facts and Health Effects*, Healthline website: <https://www.healthline.com/nutrition/foods/beef>