

Fatty Acid Composition of Black Wagyu Beef Produced in Japan:

The possibility that meat with superior eating quality and a more desirable unsaturated to saturate fat composition leads us to wonder if we may really “have our cake and eat it too”.

Introduction

Marbling and youthfulness are the primary factors which determine beef carcass quality grades in the U.S. In Japan, beef quality is based on 4 factors: (1) marbling, (2) color and brightness of lean, (3) texture and firmness of lean and (4) color, luster and quality of fat. Final quality grade is equal to the lowest grade given for each of the individual factors. Averaging or compensation is not used in grading. The idea of assigning quality grades on the basis of fat quality is unusual to Americans. While it is known that much of beef’s flavor and juiciness comes from fat, considerable effort has gone into reducing fat in American beef. Quantity of fat is of much more concern in the U.S. than is the notion of quality of fat. Aside from the necessity of avoiding off-flavors caused by grass feeding or rancidity, quality of fat is rarely given, even passing consideration.

When Japanese meat industry, university and government officials were questioned by the authors for an explanation of fat quality, precise definitions or explanations were not given. Fat quality scores given to beef carcasses in Japan seem to be based on subjective evaluations rather than on the basis of scientific study. In order to investigate the possibility that fat quality scores were related to the fatty acid composition (saturated or unsaturated), samples of subcutaneous (outside or trim) fat were obtained from 23 Black Wagyu beef carcasses at the Itoham Meat Plant in Sanda City, Japan. Sanda City is near Kobe in the heart of the traditional high quality beef producing area of Japan. The fat samples were selected from carcasses representing all 5 Japanese beef quality grades by an Itoham official who is expert in beef carcass evaluation. Permission to import the fat samples was obtained from USDA and the frozen samples were transported to Texas A&M University for fatty acid analysis.

The analyses did not establish a clear relationship between fat quality score and fatty acid composition of the fat except for the observation that palmitic acid (the least desirable saturated fatty acid; has been shown to increase serum cholesterol in humans) tended to decrease with increasing fat quality scores. This decrease in palmitic acid was accompanied by a general increase in oleic acid (the most desirable fatty acid; lowers serum cholesterol).

While the original objective of establishing a relationship between fat quality scores and fatty acid composition was not realized, we were very interested in the ratio of monounsaturated to saturated fats. This ratio exceeded 2 to 1 in the samples obtained from the Japanese Black Wagyu. This is in marked contrast to the approximately 1 to 1 ratio observed in beef carcasses in America. Because efforts to modify the fatty acid composition of cattle in this country have been so disappointing, the apparent ability of Wagyu cattle to deposit less saturated and more monounsaturated fatty acids provides scientists with an increasing model to study and should help us in the efforts to produce a modified beef product that could be consumed by heart patients and others who avoid eating meat because of a fear of consuming saturated fats.

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BLACKMORE WAGYU BEEF

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