# Good taste measured by science; oleic acid in beef used to predict taste

August 3 2009, By Kyo Torigoe

Different projects and research are under way to create standards indicating how good agricultural and livestock products taste.

Participants are working to scientifically analyze the elements that determine how well certain products taste and present those elements as a yardstick to consumers. Their goal is increase the added value of food products by trumpeting their safety and an objective assessment of their flavor.

Since spring, the menu at aria blu Tokyo restaurant in Tokyo has offered steak and other items incorporating Japanese wagyu beef from Nagano Prefecture that has been dubbed "Shinshu premium beef."

"(The meat) isn't very greasy, yet it melts in your mouth," head chef Tatsuya Numagami said. "I did a taste test and decided to order it."

Grilled ribs of Shinshu premium beef are priced at 2,280 Yen ($24) at the restaurant, which also serves it on nigiri sushi.

"We used to use other domestic beef in the same price range, but customers left a lot of it uneaten," Numagami said. "After we changed to this beef, however, they hardly leave anything."

Shinshu premium beef is a new label only given to meat that has been certified as a particularly delicious example of beef from high-quality kuroge-wagyu (Japanese black-haired cattle) from Nagano Prefecture.

The key to its succulence is the percentage of oleic acid in the beef's fatty acids.

Japanese research institutions have found that the higher the percentage of oleic acid, the more the meat will seem to melt in the mouth. Higher percentages also mean softer meat and better taste.

"There's an appraisal method by which you visually assess the degree of marbling in beef," said a member of the prefectural government involved with the project, referring to the beef marbling standard, or BMS. "However, that doesn't always reflect how good the beef tastes."

This led to the decision to use the amount of oleic acid as an objective yardstick for the taste of beef.

Three standards were set: 52 percent or more oleic acid and a BMS of eight or above on a 12-level scale; 55 percent or more oleic acid and a BMS of seven or above; and 58 percent or more oleic acid and a BMS of five or above.

A system certifying beef that meets any one of these standards as Shinshu premium beef was introduced in March. Beef with a low BMS can be recognized as premium if it contains a high percentage of oleic acid.

This is the first trial in Japan to use oleic acid as a yardstick for taste. Beef was graded after cows had been slaughtered and more than 100 wagyu cows were certified as having premium beef.

Information on where the beef could be purchased was published on the prefecture's Web site, and use of the beef is spreading to eating and drinking establishments outside the prefecture as well.

"We plan to impose requirements regarding such elements as the rearing of cattle subject to certification to ensure consumers' safety and peace of mind and give further indication of the good taste of the beef. This will raise the added value of the Nagano prefectural brand," the government staff member said.

Efforts to establish standards indicating taste also have begun in the rice country of Niigata Prefecture. These efforts are prompted by increased competition between different rice-producing regions. Niigata Prefecture's famous Koshihikari rice has long been popular, but recently varieties from Hokkaido and other areas outside Niigata Prefecture also are offering consumers improved tastes.

Niigata Prefecture has fixed its eye on the protein contained in rice. A higher percentage means harder rice that also is less glutinous and does not taste as good.

Judicious adjustment of the amount of fertilizer used during cultivation limits the amount of protein and improves the taste.

The prefecture will launch a trial next fiscal year to measure the percentage of protein in unpolished rice at such stages as shipping and pickup, thereby raising farmers' awareness of this issue.

A provisional target of 6.5 percent or lower was decided in March, and officials are considering announcing the results of the measurements.

"One element furthering these efforts is the improvement in measuring technologies in recent years," said Prof. Kiyoshi Toko of Kyushu University's Faculty of Information Science and Electrical Engineering.

Toko and others developed a taste sensor that quantifies food products' sweetness, saltiness, savoriness, acidity, astringency, body and aftertaste.

There have been many cases in which food manufacturers and others have used it to develop products, Toko said.

"We've often had to predict the taste of food from such information as price and where it was produced," he said. "There will come a time when many different elements affecting taste will be quantified and consumers will chose products based on those standards."

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