Production of ‘Noto-ushi’, high quality Wagyu beef in Ishikawa, Japan

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About ‘Noto-ushi’

- The brand beef developed in Ishikawa prefecture, Japan

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The Japanese carcass transaction standards of beef

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<th>Yield grade</th>
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- **Yield grade** is mainly evaluated by the percentage of meat in carcass.
- **Meat quality grade** is evaluated by a marbling score, luster and color of meat and fat, firmness and texture of meat and fat.
Introduction

Opening market of beef in Japan in 1990

- To compete overseas producers
  - Production of high quality beef of Japanese Black cattle (JBC)
  - Development of Beef brand

- Noto-ushi
  - Beef brand in Ishikawa in 1995
  - ‘Special award’ in the field of beef fat quality in 2007
    - The National Wagyu beef quality competition
    - Because of its higher oleic acid

- Effort to enhance the brand value
  - Study to increase beef taste by enhancing oleic acid in beef
  - Study on the relationships between blood metabolites and carcass traits
  - Development of the production system to deliver the beef to many consumers
  - Sales promotion

- Challenges
  - Variation of beef quality among the producers
  - Production was too low to answer the demand of markets

- One of popular beef brands
- Higher market price
Objectives

• Suggest the recommendations to develop a beef brand by showing
  - how the beef quality of ‘Noto-ushi’ has been improved
  - how the sales of ‘Noto-ushi’ have been promoted
How has the beef quality of ‘Noto-ushi’ been improved?

The sensory panel scores of beef were positively associated with the higher levels of oleic acid in the beef (Westerling and Hedrick 1979).

- ‘Noto-ushi’
  - ‘Special award’ in the field of beef fat quality
  - Because of its higher oleic acid

Initiation of studies on production of beef with higher oleic acid
PRODUCTION OF BEEF WITH HIGHER OLEIC ACID

• Scientific approach had not been conducted to examine the reasons why ‘Noto-ushi’ had higher oleic acid.

• The systems to increase oleic acid in beef had not been examined.

• Objectives
  - To examine types of Stearoyl-CoA Desaturase gene and oleic acid in ‘Noto-ushi’
  - To increase oleic acid content in beef by feeding rice bran
Types of Stearoyl-CoA Desaturase gene and oleic acid in ‘Noto-ushi’

- Taniguchi et al. 2004
  - The content of oleic acid in beef
  - Affected by the types of Stearoyl-CoA Desaturase (SCD) gene in the carcass fat of fattened JBC steers
    - type AA, type AV, type VV
  - Oleic acid in the carcass fat
    - Higher having type AA
    - Medium having type AV
    - Lower having type VV

- Types of SCD gene and oleic acid content of fat in ‘Noto-ushi’ were examined
Materials and methods

• The types of SCD gene and oleic acid content
  - 138 samples of carcass fat from ‘Noto-ushi’

• Effects of strains of sire on the types of SCD gene in breeding JBC cows
  - 450 cows
  - The types of SCD determined by analyzing blood samples
Fig. 1 The oleic acid contents in the fat of carcass of 'Noto-ushi' having AA, AV and VV type of SCD gene.
Fig. 2 Distribution of the types of Stearoyl-CoA Desaturase (SCD) gene in the sires of the breeding Japanese Black cows in Ishikawa prefecture
Conclusions

• Most of carcass fat of ‘Noto-ushi’ had either type AA or type AV of SCD gene and their oleic acid contents were higher than 55%.

• Even the breeding cows having the type VV gene can produce feeder cattle having type AV, if the sperm of the bulls of strains is used for reproduction.
Increasing oleic acid content in beef by feeding rice bran

- Main crop in the agriculture in Ishikawa has been rice and rice bran has been produced as the by-product.
- Beef farmers have been feeding rice bran to their cattle in Ishikawa prefecture.
- Rice bran has higher oleic acid

Hypnosis: Feeding rice bran can increase oleic acid in beef.
Materials and methods

- Feeding trials
  - Eight Japanese Black steers to
    - non-rice bran diet treatment (n=4)
    - rice bran diet treatment (n=4)
  - The rice bran diet prepared by replacing 5% of total digestible nutrients of the formula feed for fattening steer with rice bran
  - The treatment diets fed from the middle period to late period of fattening.
Fig 3. Effect of feeding rice bran on the oleic acid in 'Noto-ushi'.
*P<0.05
Conclusions

- Oleic acid in beef can be increased by feeding rice bran from middle through late period of fattening.
- No effect of feeding rice bran was observed on carcass weight, rib eye area, meat quality grade and marbling score.
REDUCING THE VARIATION OF BEEF QUALITY AMONG THE PRODUCERS

- Reduction the variation of beef quality among the producers
  - to increase income of the producers
  - to enhance the beef brand value of ‘Noto-ushi’

- Scientific data are necessary to issue guidelines on enhancing beef quality to producers.

Relationships between blood metabolites in cattle and carcass characteristics
Materials and methods

- Using 75 heads of fattening steer of JBC
- The blood metabolites concentrations were compared
  - Steers producing rank five of meat quality grade
    VS
  - Steers producing below rank four of meat quality grade
EFFORT TO INCREASE PRODUCTION OF ‘NOTO-USHI’

- Ishikawa prefecture has set the target to produce one thousands of carcasses of ‘Noto-ushi’ per year.
- Fertilized ova of Japanese Black cattle are produced in the Noto Livestock Center of ILES and are delivered to dairy farmers at lower price.
- Encourage farmers to introduce genetically high performance breeding cows and feeder stock.
Fig. 7 Changes in production of ‘Noto-ushi’

- **Premium 'Noto-ushi'**
- **Noto-ushi’**
SALES PROMOTION OF ‘NOTO-USHI’
Certification of the ‘Premium Noto-ushi’

- Started in 2011
- To enhance Test and Promote PR
- Number
  - 40 (2011)
  - 204 (2016)

- Of the carcass ranked in A5 grade
  - BMS No is higher than 10.
  - The oleic acid content is higher than 55 % when BMS No. is nine or eight.
Certification of shops to sell ‘Noto-ushi’

- Introduced
  - for consumers to find the place to buy ‘Noto-ushi’ easily.
- Certified as below;
  - The meat shops where more than three carcass of ‘Noto-ushi’ are sold.
  - The restaurants where dishes using ‘Noto-ushi’ are always served.
- Supplied to the certified shops: The flag, signboard, poster, leaflet are
CONCLUSIONS and RECOMMENDATIONS

From the experiences of ‘Noto-ushi’,

1. It is important to produce beef with good taste
   - Use the breeding cow and feeder cattle which have AA or AV type of SCD gene
   - Feed rice bran to fattening cattle from the middle period through late period of fattening.

2. The government should support the beef producers to increase the number of cattle for brand beef.

3. The certification systems for carcass and shops can promote the sales of beef.