エンリッチド・肥育牛
Improved Beef Rearing

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I am Takashi Chiba and I work as a senior staff member for the 'Environmentally Friendly Livestock Course' at the Field Science Center of the Graduate School of Agriculture Science at Tohoku University.

[Slide 1] Although my talk differs a little from what is written in the text, I am going to talk about the rearing of Japanese Shorthorn commercial cattle at the Field Science Center.

[Slide 2] As for the outline, the Field Science Center is located about 100km north-northeast of Sendai City in Miyagi Prefecture. The total area of the Field Science Center is approximately 2,215 hectares. Of this, more than 600 hectares is used for pastureland. Among the livestock being reared are beef breeds including 100 head of Japanese Blacks and 100 head of Japanese Shorthorns as well as 50 Holsteins, a dairy breed. For the beef breeds, the Center carries out integrated management ranging from breeding and rearing to fattening.

[Slide 3] This slide shows the concept governing the rearing of Japanese Shorthorn fattening cattle. From the top, rearing should be carried out in consideration of animal welfare. Next, cattle fattening should be carried out with the focus on roughage. I assume that usually, even in the case of Japanese Shorthorns, fattening cattle are fed on a livestock feed mixture comprising about 80% cereal grain and 20% rice straw for roughage. In the Kanto region however, hardly any roughage is provided at all. But here at the Field Science Center, the cattle are being reared on a mix of 80% roughage and 20% feed mixture.

The next point is that the rearing should be aimed at producing red meat. And finally, the rearing should be conducted in an enriched environment from the standpoint of animal welfare. As an enrichment measure, we have now installed brushes in the cattle sheds with a view to stimulating the cattle to behave naturally when they are inside the sheds.

[Slide 4] The characteristics of the feeding management system used for the Field Science Center's Japanese Shorthorn fattening cattle are as follows. (1) As it states in the text, most of the cattle are male. Mating is carried out as natural mating between pasturing cattle, and is followed by natural delivery that also takes place in pastureland. (2) The production of fattening cattle makes greater use of pastureland. (3) Rearing with a higher feed self-sufficiency ratio is achieved by limiting the input of commercial feed mixture. Lastly, (4) the feeding management of the cattle from birth to shipment is conducted in line with the code of conduct concerning feeding management. These are the characteristics of the feeding management system. I would now like to explain them in a bit more detail with the help of photographs.

[Slide 5] Regarding point #1, "natural mating between pasturing cattle", the photo on the left shows a bull and a cow mating naturally. The animal at the front is the cow and the one behind is the bull. At the Center, we put bulls out to grass among the cow heard for approximately 50 days, which generally achieves a high conception rate.

The photo on the right shows a cow that has given birth naturally in pastureland. Cows that became pregnant in pastureland during the previous year give birth naturally in pastureland deep in the mountains, and the mothers raise their calves by breastfeeding until

October.

[Slide 6] Moving on, regarding point #2, "the production of fattening cattle by making greater use of pastureland", at the Field Science Center we carry out 'three-season pasturage fattening production'. Generally, pasturage for one or two seasons is common, but the Center has extended this to three seasons in order to increase the use of pastureland. What this means is making use of pasturage three times over three years with six months counting as one season. I will try to explain this in a little more detail now.

[Slide 7] Firstly, during year one, as the photo on the left shows, we begin pasturage in early May by allowing the pregnant cows to move up into pastureland deep in the mountains. Then, as shown in the photo on the right, these cows deliver their calves in May or June. The mothers and calves spend the summer months in the pastureland together until October. After that, we lead them down from the mountains and put them into a cattle shed. The cows remain together with their calves for approximately six months. After that time, the calves are weaned and placed in rearing stalls.

[Slide 8] In the second year, the photo on the left shows calves that have grown into rearing cattle. These animals also spend their second year from May to October feeding on pastureland deep in the mountains. Then they are once again brought down from the mountains and placed in winter-season cattle sheds. During this time, they are fed only on roughage and bran produced in-house.

In the third year, just as in the previous year, they go up to the mountains in May, where they feed on pastureland until August. In September, they are brought down from the mountains and raised on pastureland on the low plains. We do this because the deep mountain pastureland is at an elevation of about 600 meters where the grass stops growing and runs out earlier in the autumn. So we switch the rearing cattle to the richer grass of the lowland pasture.

[Slide 10] Not long after the transfer to lowland pasture, we move into the winter season. At the start of the winter, the rearing cattle are moved from the lowland pasture into the cattle sheds. During the winter, these cattle are fed on the Center's in-house made dent corn whole crop silage pasture silage, feed rice silage and bran. This allows them to reach approximately 650kg in body weight, at which point they are shipped out.

[Slide 11] In the pastureland where the rearing cattle are pastured for three years, paddocks for capturing cattle like this and guide fences are installed. This picture shows a bull in the act of being grasped. These facilities are used in order to perform body weight measurement and sanitary surveys, which are conducted on a monthly basis. Also, since the pastureland covers a vast area, a total of six water tanks have been installed so that the cattle have access to fresh water at any time.

The photo at the bottom left shows our students taking part in a practical. The photo in the middle shows a student practicing blood collection. At the Field Science Center we try not to use rope to capture and secure calves of this size, which weigh about 100kg. Instead, we grasp them by using our own body weight. The calves appear to suffer less stress this way and it also seems to take less time to capture them.

[Slide 12] Next, regarding point #3, "rearing with a higher feed self-sufficiency ratio". This is achieved by limiting the input of feed mixture. During the pasturage period the rearing cattle feed only on pasture grass and bran, and the bran itself is only given in small amounts as a supplementary feed. During the winter, the rearing cattle are fed on in-house produced dent corn whole crop silage, in-house produced pasture silage and fed rice whole crop silage mixed in as roughage. Only during the calf period are they fed on a feed mixture comprising calf-rearing nutritional feed. We also feed them bran from the end of calf period, including in rearing period and the fattening period.

[Slide 13] Lastly, regarding point #4, the "feeding management of the cattle from birth to shipment conducted in line with the code of conduct concerning

feeding management", we have established a thorough hygiene management system, an advanced roughage-feeding method, and rearing target weights. In addition, we have established considerations with respect to cattle welfare. These consist of five items related to disease and injury management, feed management, physical environment management, normal behavior management, and cattle fear management.

[Slide 14] After carrying out rearing management based on these considerations, during the current year we are shipping three head of cattle in May and June. As for the dressed carcass records, the average shipment age of these animals was 35 months, the average shipment weight was 653kg, the meat quality evaluation was B1 and B2, and the average dressed carcass weight was 335kg. No carcass parts were disposed of. From an ordinary fattening cattle viewpoint, these results may seem very poor. But since these cattle were reared mainly on roughage and on long-term pasturage, I don't think this can be helped.

The total cost of feed for the three head of cattle scheduled for shipment in 2009 is estimated at about 300,000 yen per head.

[Slide 15] Next, I would like to announce the results of an eating quality questionnaire we conducted concerning beef from the cattle we sold this year. The survey items on the eating quality questionnaire cover the five items of aroma, texture, tenderness, taste and umami (savoriness), and the total score is calculated by adding up the results for all five items.

[Slide 16] First, let's look at the steak meat's overall evaluation. To create this evaluation, we added these items here and here. In this evaluation, 58.1% of the respondents answered "good" or "very good". Next, in the overall evaluation of the mincemeat, 75.8% of the respondents answered "good" or "very good". And thirdly, in the overall evaluation of the assigned meat, 75.8% of the respondents answered "good" or "very good". Accordingly, the total evaluation for all three items showed 67.5% of the respondents answering "good" or "very good". So, we see that the eating quality questionnaire results gained high scores, even for beef from cattle reared long-term on a roughage-centered diet.

[Slide 17] Finally, I'd like to express my own views. At livestock rearing sites, there are many occasions when we can't avoid causing pain to the animals. For example, in the case of cattle, we carry out various activities such as weaning, dehorning, castration, ear-tagging, nose-ringing, etc. Of course, we must attempt to minimize the pain caused in doing these things. In the case of weaning, for example, it is necessary to provide enough preparation time for the mother and calf to be together prior to separation. Also, in my opinion, dehorning and castration should be performed using a local anesthetic. These measures require more working time and increased costs but they can do a lot to reduce the burden of stress on the cattle.

Moving on, the general market evaluation of the fattening cattle we produced this time was low. But the eating quality questionnaire yielded good results. The apparent reason for the low general market evaluation was that the current dressed carcass evaluation standard is based on how marbled the meat is. More marbled beef is awarded a higher price. So the red meat we shipped this time fared poorly. As such, we believe that a red meat evaluation standard is required. We also think it is necessary to expand red meat consumption further by appealing the good points of red meat to consumers.

[Slide 18] This concludes my talk. Thank you very much for listening.

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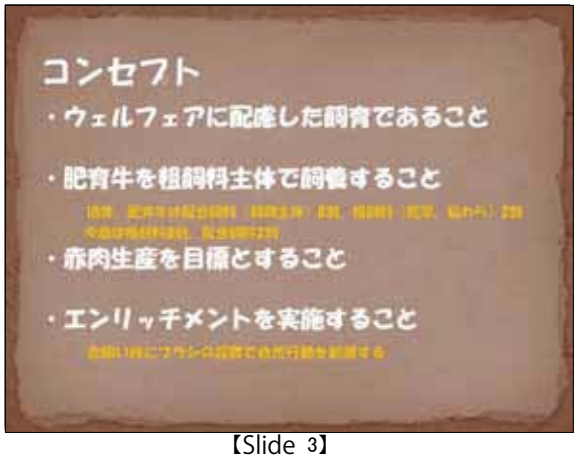
【Slide 2】



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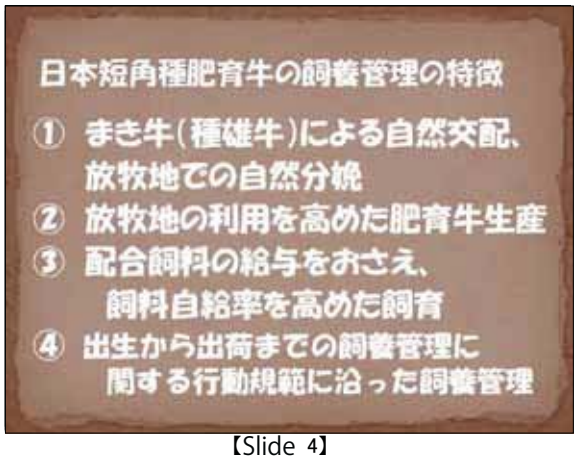

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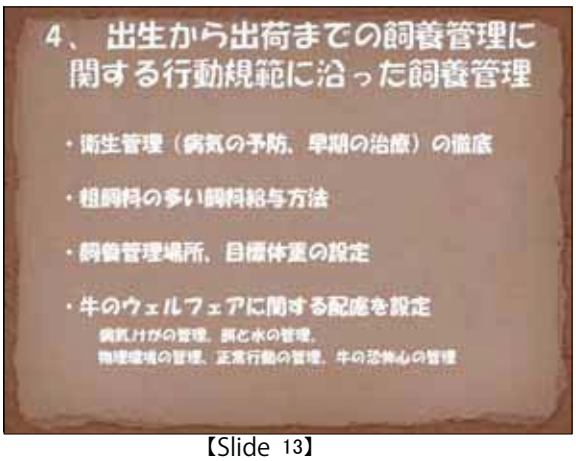

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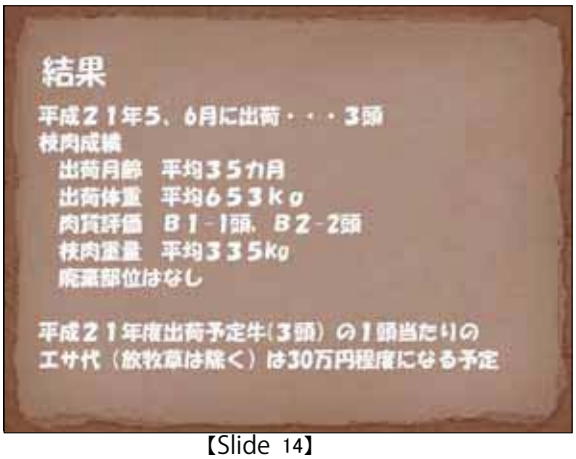

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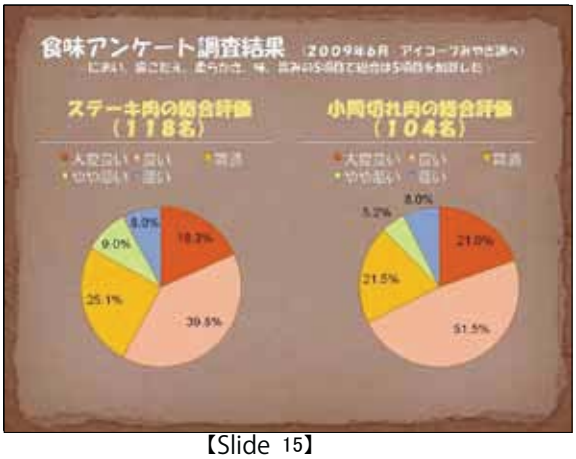

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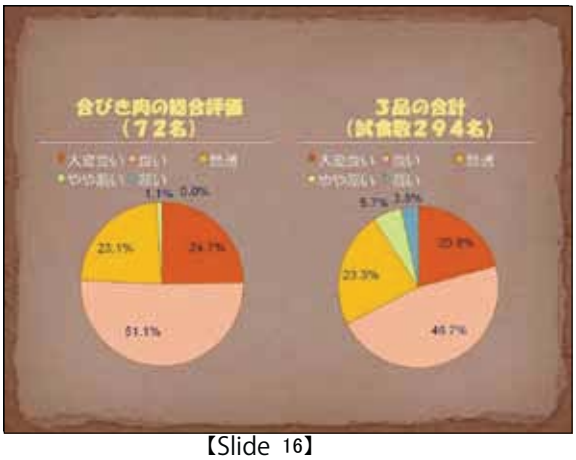

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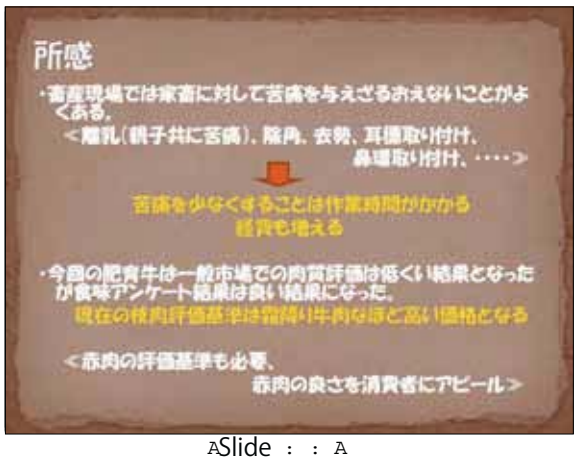

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