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"The Creation of a Good Quality Production System to Produce Safe Beef in Japan"

Current Beef Production and Organic Agriculture in Germany

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The arrival of BSE in 2000 was a shock to meat-loving Germans. The consumption of beef has fallen drastically from 10 to 7 kg per capita and year. But the BSE crisis went away soon, and the Europeans learned to live with it. Since 2003 in Germany the consumption of beef is higher than the beef production. The consumer strongly request transparent production methods from feed preparation to meat on the butcher's slab. Organic farming is one possibility to increase beef consumption.

Organic beef production in Germany means: It is not allowed to use feedstuff, except milk products, with an animal origin, and to support the animal performance artificially. In organic agriculture it is not allowed to use synthetic fertilisers, chemical pesticides and pharmaceuticals, and genetically modified organisms. The cattle live under natural circumstances if possible on pasture, and less than two cattle per hectare is recommended. Now 5 % of the cattle reared on German farms produce organic beef.

In our research institute a study was performed with 20 Hereford steers, living on pasture and 20 Holstein bulls, living in a stable to compare the muscle and fat development during growth. In general 50 kg body weight loss in winter is normal in pasture feeding in Germany. Samples were taken from *semitendinosus* muscle by shot biopsy at 140, 180, 300, 400, 470, and 570 days of life. During growth the microscopically measured diameter of muscle fibres and fat cells ceased in winter in organic beef production and also in summer the cells did not attain the level seen in cattle kept in stables. After slaughter at 18 months, only a low fat content was detected in both carcass and muscle. The intramuscular fat content was less than 1.5 % and did not meet the requirements of high quality beef which is considered to show intramuscular fat levels at least 3.5 %. These results are observed in Germany and can not be confirmed in other markets like Argentina.

Worldwide high amounts of fat storage in a body of farm animals is taken in to account for high quality beef. Valuable food is used as feedstuff for cattle. Therefore it is a very important aim for animal scientists to discover the regulation mechanisms of fat storage in body and muscle. In our research institute some studies were performed to investigate differences in plasma leptin concentration, expression of PPARγ, LPL, leptin and leptin receptor mRNA between beef and dairy breeds. In future research high marbled breeds like Japanese Black should be included. The application of knowledge for adipogenesis is useful for the improvement of meat quality and also for sustainable expenditure of food resources.