

ABSTRACT

Cellular conditions for intramuscular fat deposition in Japanese Black and Holstein steers.

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The experiment was conducted to study the development of intramuscular fat in Japanese Black (JB) compared to Holstein (HS) steers and to find breed differences for fat depot development and distribution in the carcass under equal feeding conditions. Additional to slaughter samples, biopsy samples of longissimus muscle (LM) and subcutaneous fat, taken at 10, 14, 18, and 22 months of age, were used for histological and molecular investigations. Japanese Black steers stored about 14% more fat in the LM ($P = 0.001$), resulting in larger marbling flecks ($P < 0.001$). Muscle fibers and intramuscular adipocytes in both breeds responded to the high energy feeding with significant enlargement, which was faster in JB. Histograms of intramuscular adipocytes size showed a shift toward larger cells during growth, but also the abundance of small, developing adipocytes. This development was accompanied by a correlated up-regulation of adipogenic genes until 22 months of age.

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