This simple method is based on the measurement of the size of subcutaneous adipose cells removed by biopsy. Since the experimental animals used were performance tested bulls which were not allowed to be slaughtered at the end of the test, this simple method had to be compared to another more accurate, but much more expensive *in vivo* method, based on the estimation of the dilution space of deuterium.

Sampling of experimental bulls was performed and based on the value of their synthetic selection index two extreme groups were identified. A total of 84 (2 x 42) out of 292 bulls were selected, performance tested in 2 locations and over 3 years. The selection differential between these 2 groups was 3 standard deviation units. Estimation of the correlations needed to take into account the effect of this selection process on the observed variability of the different traits.

The estimated correlation between both lipid weight estimates was +0.66 and +0.54 between lipid percentage estimates. These correlations were quite similar to the mean phenotypic correlations between carcass fat content and fat thickness in samples of cattle slaughtered at a constant age in progeny testing stations.

Using these estimates and the most likely genetic parameters from the literature, revealed that adipose cell size surpassed by 20% the expected genetic progress of an equivalent selection goal to muscle growth (selection on live weight with a constraint on fat weight). This method of *in vivo* estimation of fatness can therefore be used in performance testing stations in France.

Effects of early nutritional deprivation on adipose tissue growth and metabolism in calves. J. Robelin [1] and Y. Chilliard [2] *([1] Laboratoire de la Production de Viande, and [2] Laboratoire de la Lactation, INRA, Theix 63122, Ceyrat, France)*

Two groups of 10 newborn calves received 819 and 1380 g, respectively, of milk replacer daily until 95 d of age. After weaning, both groups were pairfed until slaughter at 533 d of age. Body composition, cellularity and lipogenic activity of kidney and omental fat were determined at 95 and 533 d of age. Milk intake restriction produced a 40% reduction of growth rate and a 68% decrease in lipid deposition between birth and 95 d of age, and a reduction of adipose cell hypertrophy without any effect on adipose cell number. *De novo* fatty acid synthesis, measured by acetate incorporation into isolated cells, glucose-6-phosphate dehydrogenase and NADP-malate dehydrogenase activities were lower in restricted animals. Fatty acid uptake from plasma measured by lipoprotein lipase activity was also reduced by nutritional deprivation. Glucose incorporation into isolated fat cells was very low in both groups compared to acetate incorporation.

All the lipogenic parameters were more than 10 times higher in 533 d old animals which have larger adipocytes, than in younger calves. Early postnatal nutrition had no significant effect on lipid deposition between 95 and 533 d of age. There were no significant differences in body composition, adipose tissue cellularity or metabolism at slaughter. Regardless of the nutrition level, kidney fat appeared to have a higher rate of fatty acid synthesis than omental fat. On the contrary, this latter tissue had a higher lipoprotein lipase activity, indicating a role in fatty acid storage.

Adipose tissue and lipid metabolism in dairy cows during rape-oil duodenal infusion in early and mid-lactation. Y. Chilliard [1], G. Gagliostro [1,4], J. Flechet [1], A. Ollier [1], D. Bauchart [2], M. Vermorel [2], M.-J. Davicco [3] *([1] Lactation Laboratory, INRA, Theix 63122, Ceyrat, France, [2] Energy Metabolism Laboratory, [3] Unit of Mineral Metabolism Regulation in Small Ruminants and [4] INTA, Balcarce, Argentina)*

Rape-oil was continuously infused (1.0—1.1 kg/d) for 3 weeks into 6—8 cows after calving (as compared to 6—7 control cows, trial 1) and into 9 cows after the second month of lactation (cross-over design, trial 2, Chilliard and Gagliostro (1988; *Reprod. Nutr. Dev.* 28 (suppl. 1), 173-174). The aim was to study the effects of exogenous long-chain fatty acids, without