

Sources of variation in composition of milk fat

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Fatty acid composition of milk fat in nearly 7 000 samples from about 3 500 cows sired by 114 A.I. bulls was determined by gas liquid chromatography. The findings may be summarized as follows :

a) Stage of lactation was found to have a significant influence on the proportion of all fatty acids. Most short-chain acids showed a maximum and most long-chain acids a minimum in mid-lactation.

b) Repeatability estimates for proportion of various fatty acids ranged from zero to 0.37, and heritability estimates from 0.05 to 0.26.

c) The genetic correlation between fat percentage and the proportion of various fatty acids was consistently positive for the short-chain acids and negative for the C 18 acids.

Frozen embryos as genetic resources.

Theoretical considerations, cost estimations and practical experience

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Preservation of cattle breeds by frozen/thawed embryos allows conservation of extra-chromosomal genetic material, immediate reestablishment of purebred populations of extinct breeds and establishing of control population for direct measurement of genetic changes. Costs depend on the rates of success. About DM 100 000 might be sufficient for a embryo-bank which is sufficient to reestablish a breed. Practical experiences in establishing a embryo-bank of the breed *Murnau-Werdenfelser* (17 frozen in 2 years) show that it becomes very difficult if population size is already low.

Effects of different deep freezing and thawing procedures on the developmental capacity of bovine embryos

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This report is about some problems of deep-freezing cow-embryos. The older blastocysts (day 8) had better survival rates than the younger morula stages (day 6). Only insufficient survival rates were achieved with a slow freezing and thawing procedure (42.1 p. 100 with DMSO, 21.3 p. 100 with Glycerol). 58.7 p. 100 of the embryos survived with the fast method (transfer into liquid nitrogen at -35°C , thawing in warm water) and Glycerol

as cryoprotectant. In average, embryos without morphological visible damages developed to 77.1 p. 100 (68.8 p. 100, 85.7 p. 100, 83.3 p. 100) during *in vitro* culture; embryos with small partial damages only to 16.7 p. 100. 5/12 (41.7 p. 100) of the synchronised recipients were pregnant after non-surgical transfer of frozen thawed embryos. The work is still in progress for further development and improvement of the simple fast method for deep-freezing cow-embryos.

Genetic variation in production traits of Atlantic Salmon and Rainbow Trout

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A study of genetic variation in production traits of Atlantic Salmon (*Salmo salar*) and Rainbow Trout (*Salmo gairdneri*) have been carried out. Heritabilities for weight of fish were estimated at 0.37 in salmon and about 0.20 in Rainbow Trout. For maturity the heritabilities were found to be 0.42 in salmon and 0.14 in Rainbow Trout. For belly thickness it was found to be 0.17 in both species. The heritabilities for dressing percentage and flesh colour did not differ significantly from zero.

The genetic correlation between weight of fish ungutted and gutted was estimated at 1.00 in both species and between these traits and length close to 0.90. Between belly thickness and weight/length it was also high. Between maturity and the other traits the genetic correlations were positives; medium in Salmon and low in Rainbow Trout.

Growth rate and mortality of crosses between strains of Atlantic Salmon

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Five different strains of Atlantic Salmon (*Salmo salar*) were used in a diallel cross. Mortality of eyed eggs, alevins, fry and fish after 2 years in the sea, have been studied. No significant differences between crosses and purebred and between strains with regard to general and specific combining ability were found for any of the traits studied.

It is concluded that crossbreeding of strains are of little interest in a future breeding program for Atlantic Salmon.