

Selection for efficient lean growth on restricted feeding. A preliminary analysis of genotype by environment interaction.

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In selection programs, performance testing of boars is often carried out on a restricted feeding regimen. This differs from commercial conditions where pigs are usually fed close to *ad libitum*. It is important to quantify the interactions between genotype and sexes and genotype and feeding regime. Such results would be useful for designing management systems for selection and genetic evaluation programs.

The study was conducted in Large White pig lines undergoing divergent selection for high and low live weight gain (McPhee et al., 1999; Nguyen et al., 1999). Performance testing of pigs is carried out on either a grower ration restricted to an estimated 80% of average *ad libitum* intake or on *ad libitum* feeding over a 6-week period starting at 50 kg weight. All animals are

provided the diet containing 14 MJ DE, 0.65g/MJ available lysine. Live weight and ultra sonic backfat thickness at P2 are measured at the end of the test.

Preliminary analysis was applied on 2662 data records to determine the significance of fixed effects for all performance traits (Genstat 5, 1997). Genetic (co) variances for performance test traits measured in the two sexes and feeding regimes were estimated using a restricted maximum likelihood analysis of multivariate models fitting batch and sex as fixed effects, and individual animal as random effect (ASREML, Gilmour, 1999). Estimates of genetic correlations of the same performance traits measured in the two sexes and feeding regimes are presented in Table 1.

Table 1: Genetic correlations (standard error) of the same traits measured under different feeding regimes and sexes

Traits	ADG	P2- fat	FCR
Between sexes	*	1.15 (0.10)	0.60 (0.11)
Between feeding regimes	0.16 (0.14)	0.67 (0.14)	0.75 (0.12)

* failed to converge

Genetic correlations of the same traits measured in the two sexes and feeding regimes are mostly significantly less than one (Table 1), indicating the existence of genotype x sex, and genotype x feeding regime interactions for growth rate. This is less apparent for P2-fat and food conversion ratio.

It is concluded that a genotype x feeding regime interaction is present for growth rate. Thus performance testing on restricted feeding will lead to the selection of some animals on growth rate which would not have been selected had *ad libitum* feeding been used.

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