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## Selection of a suitable definition of environment for the estimation of genotype × environment interaction in the weaning weight of beef cattle

L. Vostrý, J. Příbyl, V. Jakubec, Z. Veselá, I. Majzlík

<https://doi.org/10.17221/351-CJAS>

Citation: Vostrý L., Příbyl J., Jakubec V., Veselá Z., Majzlík I. (2008): Selection of a suitable definition of environment for the estimation of genotype × environment interaction in the weaning weight of beef cattle. Czech J. Anim. Sci., 53: 407-417.

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Genotype by environment interactions for weaning weight in beef cattle were tested using several definitions of environments. Four breeds of beef cattle (Hereford, Aberdeen Angus, Beef Simmental, and Charolais) were represented. The environments were defined according to five criteria: altitude, production areas, economic value of the land, less favourable areas, and performance levels of a breed within herds. Ten mixed models were compared including the effects of direct and maternal genetics, herd-year-season, maternal permanent environmental, breed, environment, genotype × environment interaction, sex of calf, and age of dam. The suitability of the models was tested by Akaike's Information Criterion, likelihood ratio test, and magnitude of the residual variance. The most suitable definitions of environment were less favoured areas and herd levels of performance. Estimates of direct heritability ranged from 0.07 to 0.19. Genotype × environment interactions should be included in a genetic evaluation model for interbreed comparisons of beef cattle in the Czech Republic.

**Keywords:**

environment; beef cattle; genetic parameters; REML; maximum likelihood

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## IF (Web of Science)

2017: **0.955**

5-Year Impact Factor: **1.06**  
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