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Genotype effects on energy and protein requirements in growing goats

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**Supplementary material**

*Equation (1): Statistical model applied to estimate net and metabolizable protein requirements for maintenance:*

Yijk = β0i + β1i × Xijk + sj + eijk (1)

where *Yijk* is nitrogen or protein retained in the empty body weight (**EBW**; g N/kg EBW) for the *kth* goat of the *ith* goat type in the *jth* study, *Xijk* is the nitrogen or metabolizable protein intake of the *kth* goat of the *ith* type in the *jth* study. *β0* and *β1*are parameters to be estimated for each of the 3 goat types, *sj* is the random effect of the *jth* study assumed to be normally distributed ~ *N* (0, σ2s), and *eijk* is the residual error ~ *N* (0, σ2e).

*Equation (2): Statistical model applied to estimate energy requirements for maintenance*

HPijk = β0i × exp(β1i × MEIijk) + sj + eijk (2)

where *HPijk* is heat production (kJ/kg0.75 EBW) of the *kth* goat of the *ith* goat type in the *jth* study, *MEIijk* is the metabolizable energy intake (kJ/kg0.75 EBW) of the *kth* goat of the *ith* type in the *jth* study. *β0* and *β1*are parameters to be estimated for each of the 3 goat types, *sj* is the random effect of the *jth* study assumed to be normally distributed ~ *N* (0, σ2s), and *eijk* is the residual error ~ *N* (0, σ2e).

*Equation (3): Statistical model applied to estimate protein and energy requirements for maintenance, as well to fit the allometric equation to account for maturity (using total body energy as dependent variable and total body protein as independent variable)*

Log10Yijk = β0i + β1i × Log10Xijk + sj + eijk (3)

where *Yijk* is total energy (kJ) or protein (g) in the EBW for the *kth* goat of the *ith* goat type in the *jth* study, *Xijk* is the EBW or the protein (i.e., g, only when energy is used as dependent variable) of the *kth* goat of the *ith* type in the *jth* study. *β0* and *β1*are parameters to be estimated for each of the 3 goat types, *sj* is the random effect of the *jth* study assumed to be normally distributed ~ *N* (0, σ2s), and *eijk* is the residual error ~ *N* (0, σ2e).