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**ABSTRACT FORM**

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***Title:*** The genetic basis for the selection of goats resistant to gastrointestinal nematodes

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In Australia and New Zealand the formulation of breeding values for GIN resistance led to large selection programs in sheep successfully improving genetic resistance to GIN. Compared to sheep, the progress with respect to breeding for GIN resistance for various reasons has been much slower in goats. Data on heritabilities of potential auxiliary traits for selection and knowledge about their genetic correlation to production traits is limited. The present Swiss study was designed to fill this gap.

A total of 1.500 goats (20 flocks) of the Alpine and Saanen breed were enrolled in the study. They were individually phenotyped twice for faecal egg count (FEC), FEC of Haemonchus (HCFEC; using fluorescin based differentiation of eggs), FAMACHA eye scores and packed cell volume (PCV) within the period from May to October 2012. After the first phenotype recording, GIN infections of all study animals were cleared with either Eprinomectin or Levamisole in order to assure recording of independent GIN populations. The efficacy of anthelmintic treatments was determined by faecal egg count reduction tests (FECRTs). Heritabilities of and genetic correlations between traits were estimated using mixed linear models with transformed FEC, FAMACHA, PCV and milk yield as dependent variables. Breed, season, sex, type of anthelmintic treatment, age, lactation number were considered fixed effects, whereas animal, classifier, herd and permanent environment were modelled as random effects.

The heritability of FEC was around 0.08. Although the heritabilities of Famacha eye scores and PCV were 0.24 and 0.23, the genetic correlation of these traits with FEC was low. The genetic correlation between FEC and milk yield was low. Heritability of HCFEC was slightly smaller (0.05) compared to FEC but the genetic correlations were more pronounced: 0.22 for HCFEC and FAMACHA, -0.52 for HCFEC and PCV. However, we also found the genetic correlation between HCFEC and milk yield to be 0.62, which is a downside for the future implementation of a selection program for increased genetic resistance to GIN in goats.

FECRTs revealed considerable resistance of GIN populations against Eprinomectine (30-95% efficacy) and a comparatively good efficacy of Levamisole (85-100% efficacy).