First approaches for a combined use of microsatellites and pedigree data to estimate relationships
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The main objective of conservation is the preservation of genetic diversity. Among several tools recommended to measure genetic variability relationship coefficients are often used. They can be estimated from pedigree but also from direct knowledge of the genotype. The Skyros pony is an example of a small breed concerned by the management of genetic variability. However, the analysis of the pedigree showed its very poor quality. A part of the population was therefore genotyped for 16 microsatellites and two estimators of relationships were tested: the Lynch & Ritland (L&R) (only based on genotypes and described as having the best performances for all population compositions of the mammal species) and a new estimator (developed for this study and combining pedigree and microsatellite information). In order to compare the results, a Principal Components Analysis (PCA) was performed. The new estimator explained a higher percentage of information within the 3 principal factors of the PCA (41.99%) than the L&R estimator (20.61%). The graphic PCA representation showed a better separation between the reference group and the rest of the population in the case of the new estimator. The new estimator showed interesting preliminary results and results support interest of combining information in case of incomplete pedigrees and/or use of a limited number of markers.

Comparing the effectiveness of different models in accounting for the cyclic effect of months
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Yearly effect on milk yield of Japanese Holstein cows was linear whereas monthly effect was cyclic. These results were used to simulate the data with or without interaction between year and season. Four different models were compared: (1) \( x=F+Y+P+e \), (2) \( x=FY+P+e \), (3) \( x=F+YP+e \), and (4) \( x=FP+Y+e \) where \( F= \) farm effect, \( Y= \) year effect, and \( P= \) period effect. The length of period is every 15 days (\( P_{15} \)), 30 days (\( P_{30} \)) or 90 days (\( P_{90} \)). \( R^2 \) adjusted for degree of freedom (\( R^2_* \)) for all models were larger with \( P_{15} \) than with \( P_{30} \) or \( P_{90} \). Model 1 with \( P_{15} \) effect had the largest \( R^2_* \) in the absence of interaction whereas Model 3 with \( P_{15} \) effect had the largest \( R^2_* \) in the presence of interaction. \( R^2 \) from regressing the predicted on the true residuals (\( R^2_r \)) was the largest for Model 1 with \( P_{30} \) effect in the absence of interaction but was the largest for Model 3 with \( P_{90} \) effect in the presence of interaction. The results suggest that the choice of a model for statistical analysis depends upon the length of the periods, the data structure, and the nature of interaction. Model 1 best fitted the simulated data in the absence of interaction whereas Model 3 best fitted the simulated data in the presence of interaction. The fitting of \( P_{15} \), \( P_{30} \), or \( P_{90} \) depends upon the cyclic nature of the period within year.