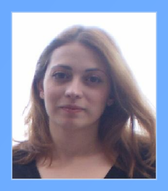
Correlation between *Mycobacterium avium* subsp. *paratuberculosis* ELISA results in sera and milk of Greek dairy goats



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Background & Objective

Screening of milk samples for the detection of antibodies against *Mycobacterium avium* subsp. *paratuberculosis* (MAP) is appealing due to the low cost, the ease of sample collection and the minimal additional work required by the farmer compared to the collection of serological samples. Studies in dairy cattle showed that the concentration of antibodies against MAP in milk varies with the lactation stage (Nielsen et al., 2002).

The objective of this study was to estimate the correlation between MAP enzyme-linked immunosorbent assay (ELISA) results in paired serum and milk samples, obtained from Greek dairy goats at different stages of lactation.

Materials and methods

Samples were collected from two hundred and twenty-five goats from a dairy goat flock with known history of clinical paratuberculosis, which kidded in the period from December 2008 to March 2010. During this period, paired serum and milk samples were obtained four consecutive times: at kidding, two and four months later and at the end of their seven-month-long lactation period. The samples were tested with an ELISA commercial kit (Pourquier® ELISA Paratuberculosis).

For each stage of lactation, ELISA results were interpreted at the recommended by the manufacturer cut-offs (S/P ratio 0,45 for sera and 0,2 for milk) and at cut-offs reduced by 50% (Kostoulas et al., 2006). For each lactation stage and cut-off selection, the dichotomized results of the paired serum and milk samples were cross-classified in two-by-two tables. McNemar's χ^2 test for symmetry was performed to assess whether proportions of positive results differed between paired serum and milk samples. Additionally, for each lactation stage, we estimated the concordance correlation coefficient (r_{ccc}) between the S/P ratios of the paired serum and milk samples.

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Results

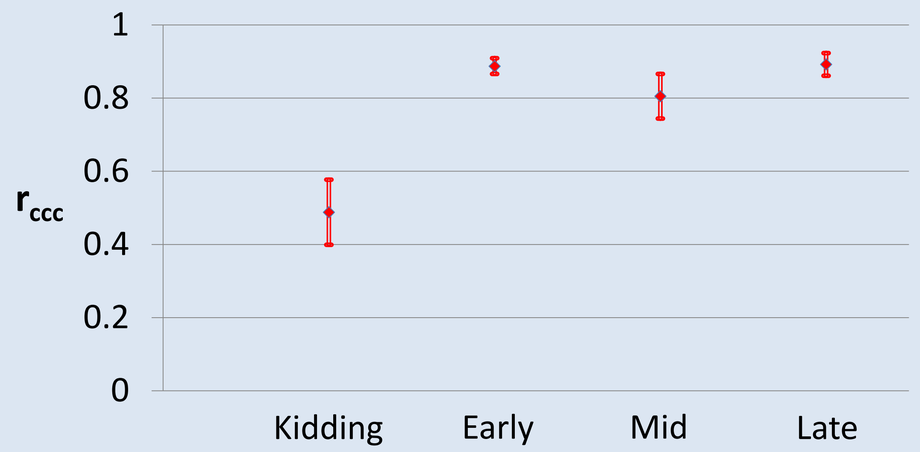
Table. McNemar's test of equality in the proportions between *Mycobacterium avium* subsp. *paratuberculosis* (MAP) indirect enzyme-linked immunosorbent assay (ELISA) results in paired serum and milk samples. Results were interpreted at the recommended cut-offs and at cut-off values reduced by 50%.

Stage of lactation	Recommended cut-offs McNemar's χ^2 (p-value)	50% reduced cut-offs McNemar's χ^2 (p-value)
Kidding	01.80 (0.3750)	00.20(1.0000)
Early	01.00 (1.0000)	00.00(1.0000)
Mid	02.00 (0.5000)	00.67(0.6875)
Late	12.00 (0.0005) §	07.14(0.0129) §

§indicates significant results at $P < 0.05$

Results

Figure. Concordance correlation coefficients (r_{ccc}) and 95% confidence intervals for the S/P ratios of paired milk and serum samples by lactation stage.



Conclusions

1. Milk ELISA was equally good to the serum ELISA throughout lactation and may outperform serum ELISA at late lactation.
2. The r_{ccc} was low-to-moderate at kidding. Recently, Moreno-Indias et al. (2011) reported that the IgG concentration in goat colostrum declines rapidly in the first 10 hr after kidding.

References

1. Kostoulas, P. et al. 2006. Prev. Vet. Med., 76, 56-73.
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3. Moreno-Indias et al. 2011. Small Rumin. Res., In Press.