

Haptoglobin: A biomarker for selective dry cow therapy

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The absence of any visible signs makes diagnosis of subclinical mastitis (SM) difficult (1,2) leading to delays in treatment and control, allowing the spread of mastitis-causing pathogens and long-term reduction in milk yield (2,3). Haptoglobin (Hp) is a specific marker of mastitis as the Hp concentration in milk from healthy quarters is low or undetectable (4). Dry cows are routinely treated with long acting infusions of antimicrobials to rid the udder of bacteria that could cause mastitis and to treat any SM present. In the UK, blanket use of antimicrobials is extremely high: 99% of dairy cows receiving antimicrobials at this point (5). AMR concerns have led to restrictions on the use of antimicrobials in dry cows in Nordic countries and the Netherlands where antimicrobial treatment is recommended only where mastitis is present. Exploration of diagnostics to direct antibiotic use is an important part of the AMR response (6) and in this context determination of the most appropriate biomarker to direct antibiotic treatment in dry cows is therefore timely. This study explored the use of Hp as a biomarker for subclinical mastitis in dry cows alongside SCC, CMT and bacteriology. Over 11 weeks 409 quarter milk samples were obtained at dry off from 104 cows. SCC, CMT, bacteriology and Hp concentrations were determined. Of the 409 samples 278 had no bacteria cultured, 61 were contaminated and in 70 a specific bacteria was isolated. Hp, determined by ELISA was found to have superior sensitivity as a marker for mastitis compared to either SCC or CMT, suggesting that Hp is the most suitable biomarker on which to select cases for antimicrobial therapy at dry off (Table 1), thus ensuring selective dry cow therapy does not compromise health, welfare and future productivity. For a point of care (POC) mastitis test sensitivity is the most important diagnostic criteria. Together with established bodies of research and recent work by other groups (7) our results demonstrate that Hp is potentially the single most useful biomarker of mastitis in milk, and as such is the most appropriate target for assessing udder health in dry cows at point of care.

Table 1: Sensitivity and Specificity for Hp, SCC and CMT with bacteriology as the gold standard.

	SCC	CMT	Hp
Sensitivity	0.69	0.46	0.76
Specificity	0.61	0.76	0.58

Acknowledgements

This article is based upon work from COST Action FA1308 DairyCare, supported by COST (European Cooperation in Science and Technology, www.cost.eu). COST is a funding agency for research and innovation networks. COST Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.