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## **The relationship between faecal egg count reduction and the lethal dose 50% in the egg hatch assay and larval development assay.**

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### **Abstract**

The relationship between resistance detected in the faecal egg count reduction test (FECRT) and the lethal dose 50% (LD50) in the egg hatch assay (EHA) for benzimidazoles (BZs) and a larval development assay (LDA) for BZs, levamisole (LEV) and ivermectin (IVM) was examined on 13 sheep farms and 12 goat farms in Denmark. Out of 10 farms where resistance to BZs was detected according to the FECRT, nine (90%) had LD50 values above 0.5 microM thiabendazole (TBZ) (0.1 microg TBZ/ml) in the EHA, indicating resistance to BZs. However, four out of the 12 isolates susceptible to BZs in the FECRT had LD50 values higher than 0.5 microM TBZ in the EHA. For all isolates examined, LD50 values for TBZ in the LDA were lower than in the EHA. Four out of 11 and five out of 12 farms with worm populations resistant to BZs according to the FECRT and EHA respectively, had LD50 values lower than 0.5 microM TBZ in the LDA. Using the same cut-off point for resistant isolates in the LDA as in the EHA (0.5 microM TBZ), these isolates would be considered susceptible to BZs. All 10 isolates susceptible to BZs according to the FECRT and EHA and two isolates with suspect BZ resistance had LD50 values lower than 0.5 microM TBZ in the LDA. The above results indicated fairly good agreement in the detection of BZ resistance between the FECRT, EHA and the LDA. Groups of farms where resistance to LEV was detected according to the FECRT had higher mean LD50 values compared to those with LEV-susceptible or suspected resistant isolates. However, only four out of 12 farms having isolates resistant to LEV had LD50 values higher than 1.2 microM LEV (0.28 microg LEV/ml) recorded previously for a LEV-susceptible strain of *Ostertagia circumcincta*. This indicated discrepancies in declaring resistance to LEV between the FECRT and the LDA. Isolates from four farms where resistance to IVM was detected in the FECRT had LD50 values higher than the susceptible isolates. These were 2.5 to 7.5 times higher than those recorded previously for IVM-susceptible strains.