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Comparison of resistance of different poultry lines to intramuscular or oral inoculation by *Salmonella enteritidis*.

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The resistance of 9 poultry lines to experimental infection by *Salmonella enteritidis* (Se) was compared at 2 ages. Y11 is a meat-type strain selected by Ricard (INRA), B13 is a histocompatible inbred White Leghorn, PA12 is a White Leghorn, C1-C3 are 3 commercial strains and H-SRBC, L-SRBC, C-SRBC are the lines selected for high or low antibody levels against sheep red blood cells by Van Der Zijpp (1983) as well as their control line. After intramuscular inoculation of day-old chickens with 4 doses, lethal doses 50% (LD₅₀) differed by more than 3 logarithms. Y11 was resistant (LD₅₀ > 10⁵ Se), C1, C2, C3 and B13 were susceptible (LD₅₀ < 10² Se) and the others were intermediate. Y11, C2, PA12 and B13 were further investigated by oral inoculation of day-old chickens (5 x 10⁷ or 5 x 10⁸ Se per animal). The resistance of the 4 lines to lethality after oral infection ranked in the same order as their resistance to lethality after intramuscular inoculation. Four weeks after oral inoculation, the spleens, livers and caeca of surviving animals were cultured for Se. The spleens and livers of resistant animals were less often contaminated than those of susceptible animals. In contrast, very little difference could be observed in the caeca. The same lines were tested for resistance to oral inoculation at the peak of laying with 10⁹ Se per animal.

All eggs laid during 4 weeks after inoculation were investigated and the bacteria in the yolk were distinguished from those on the shell. C2 shed and excreted more Se than the other lines. Y11 laid no contaminated eggs whereas B13 and PA12 laid only one contaminated egg. As for intestinal and caecal shedding, C2 was the most susceptible, Y11 was intermediate and the others were more resistant. C2 was by far the most susceptible to spleen and liver contaminations. These results observed on chicks are in agreement with Bumstead and Barrow's (1988) observations on inbred strains. These authors suggested the existence of a major gene. Measurements of resistance of crosses of our lines are needed to conclude to the putative role of such a gene. This gene could be an equivalent of the Se resistance gene Ity/Bcg/Lsh discovered by Plant and Glynn (1976). RFLP polymorphisms between B13 and Y11 were evidenced with Southern migration for 4 murine marker genes, which are located, at least in mice, on both sides of the Ity/Bcg/Lsh gene. The differences between ranking of the lines for resistance to oral inoculation at the 2 ages could be due to the physiological status, age, dose and microflora differences. The time between inoculation and culture may also have played a role. Kinetics of intestinal colonisation and organ infection are needed to conclude this study.

References

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