Age and Dose Dependent Susceptibility to *Mycobacterium Avium* Subsp. *Paratuberculosis* Infection in Dairy Cattle

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Johne's disease (JD) is caused by *Mycobacterium avium* subsp. *paratuberculosis* (MAP) and is a chronic wasting disease, responsible for severe production losses in the dairy industry. Since no treatment is available, the focus is on prevention of infection of young calves. This approach is predominantly based on superseded research in which few animals were included and trials not standardized and this makes a weak basis for assumption of age related susceptibility.

An infection trial was performed in which we aimed to identify the age and dose at which calves are susceptible to infection with MAP. Fifty Holstein-Friesian calves were experimentally infected at 5 different ages (14 days, 3, 6, 9 & 12 months), and in each age group 5 calves were infected with a low and 5 with a high dose of MAP bacteria. There was also a non-infected control group of 6 calves. All calves were euthanized at 17 months of age to determine the infection status.

At necropsy, gross and microscopic lesions were assessed and bacterial culture was done on numerous tissue samples. Lesions and MAP were found in all 5 age groups and with either dose of MAP. Calves inoculated at 2 weeks and 3 months had more culture-positive tissue locations and higher microscopic lesion scores. Furthermore, calves infected with a high dose had more severe lesion scores compared to calves infected with a low dose.

Using a commercially available ELISA, antibodies were detected in all age and dose groups except for the 6 month low dose group. Calves inoculated with a high dose of MAP had more ELISA-positives especially when inoculated at 2 weeks or 3 months of age compared to calves inoculated with a low dose of MAP.

Implications: Calves older than 6 months of age are still susceptible to MAP infection and control programs should be focussing on lowering the infection pressure on the entire farm next to prevention of infection of young and adult calves.