Iron Status and Meat Intake during Infancy - Results from the Dortmund Intervention Trial for Optimization of Infant Nutrition (DINO)

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During infancy growth, cognitive and neuronal developments afford high amounts of iron. After the period of exclusive milk feeding exogenous iron is required. Meat is known as a good source of well bioavailable heme iron and is therefore included in the first complementary food recommended in Germany. In recent years, baby food companies reduced the amount of meat in commercial meals to the lowest level allowed by European law (8% of weight), whereas pediatric recommendations still insist on 12% today. So far, there has been little scientific evidence of the possible impact of such reduced meat content on the iron status in healthy infants.

The present thesis is looking into the data gained from the double-blinded, randomized, controlled Dortmund Intervention Study for Optimization of Infant Nutrition (DINO). The primary analysis examined, whether a low-meat intake (LM, 8%) via currently available vegetable-meat meals compared to a high-meat intake (HM, 12%) leads to an impaired iron status at the age of ten months, after an intervention period of at least four months. For this a sample of 97 healthy term-born infants was being examined, including venous blood sampling (iron status indicators) at the age of four, seven and ten months and continuous dietary records starting after the second month of life.

A secondary analysis examines the impact of breast-feeding and concomitant low iron intake on the iron status during the complementary feeding period.

The results show that low meat intake did not significantly impair iron status, with a tendency towards higher values (hemoglobin, ferritin) in the HM group. In the subgroup of breast-fed infants, a weak evidence of a benefit was found for the iron status (regarding Hb) of the HM group from a higher meat intake.

Iron status indicators of breast-fed and formula-fed infants did not differ after the first four months of full milk feeding, but later, during the complementary feeding period, to 11% of (formerly) breast-fed infants developed Hb <10.5 g/dl.

In conclusion, the low meat content of current commercial complementary food does not significantly impair the iron status in healthy infants fed according to the German dietary schedule (of the Research Institute of Child Nutrition), but may pose a risk for the development of impaired iron status in some breast-fed infants. These data support the recommendation to introduce complementary food with highly bioavailable iron in the age period of four to six months in particular for breast-fed infants.