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## How studying immunonutrients in early life: the neonatal rat model

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Animal models are essential to increase the current knowledge about the immunomodulatory properties and mechanisms of particular nutrients in early life. Two aspects are crucial when choosing the animal model for this type of studies: the experimental feasibility of the dietary intervention and knowing which biomarkers can allow to examine whether the supplementation with the nutrient of interest accelerates its immunological time course maturation. The suckling rat immunonutrition model satisfies both aspects. Firstly, the benefits of a short-gestation period animal such as the rat has shorter interventional periods, lower relative cost and better availability and manageability in a laboratory setting than larger animals. Secondly, we have established the main changes on the systemic and mucosal immune system development during rat suckling and therefore these elements can be used as target biomarkers for studying the influence of particular nutrients<sup>(1,2)</sup>. Moreover, studies using the neonatal rat model allow using different approaches consisting of manipulating the maternal diet during gestation and/or lactation, or feeding directly to the pups<sup>(3)</sup>. These approaches may help to establish when nutritional programming can provide better outcomes. In summary, the suckling rat as a model allows research about nutrition in early life for programming and immune development.

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