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Potential of systemic humoral immune response in suckling rats by conjugated linoleic acid (CLA)

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Cis-9, *trans*-11 (c9, t11) and *trans*-10, *cis*-12 (t10, c12) are the predominating molecules in the positional and geometrical isomers mixture termed CLA. Although CLA has shown positive effects on human health and seems to be associated with immunomodulatory activities, its effect in the developing immune system has not been studied. Thus, the present study was designed to establish the effect of CLA supplementation during gestation and/or lactation on humoral immune response, i.e. by analysing sera Ig levels during the suckling period. Wistar rats were allocated to four groups (A, B, C and W) on day 7 of pregnancy. From day 7 and throughout the study period group C and W gestating mothers were fed standard pellet chow. Group A and B dams were fed 10 g CLA (80% *cis*-9, *trans*-11, 20% *trans*-10, *cis*-12; Lipid Nutrition B. V. Wormerveer, The Netherlands)/kg pellet chow during gestation. Moreover, group A mothers were also fed the CLA-supplemented chow until the litters were 21 d old, the end of suckling period. Group B and C litters received the CLA mixture of isomers by daily oral administration while their respective dams were fed standard pellet chow during lactation. In all cases litters were equalised to ten rats per lactating mother. Pups from each experimental group were killed at the end of the second week of life (day 14) and at the end of the suckling period (day 21), and blood samples were collected. Serum IgA, IgG and IgM levels were quantified by the ELISA sandwich technique. ANOVA and *post hoc* comparisons (LSD test) were performed. Differences were considered to be significant at $P < 0.05$. Animals receiving CLA passively from their mothers (group A) during gestation and the suckling period exhibited the highest concentrations of IgG and IgM at 14 d old ($P < 0.05$; see Table). At the end of suckling period the serum IgG concentration in this group was also increased, up to three times more than in the other groups ($P < 0.05$). Those animals supplemented with CLA only during suckling period (group C) showed no difference in relation to those receiving no supplement. Thus, these results demonstrate that CLA supplementation during gestation and lactation promotes systemic humoral immune response.

Age	Group	Serum IgG (mg/ml)		Serum IgM (µg/ml)	
		Mean	SE	Mean	SE
Day 14	A	11.5†‡	0.84	79.8†‡	4.67
	C	2.09	0.34	64.4	2.56
	W	1.71	0.30	59.5	4.19
Day 21	A	22.1*†‡	2.0	88.1	7.61
	B	7.73	0.7	100.7	12.0
	C	3.94	0.28	98.7	6.70
	W	4.79	0.21	94.8	3.58

n 10. Mean values were significantly different from those for group B: * $P < 0.05$. Mean values were significantly different from those for group C: † $P < 0.05$. Mean values were significantly different from those for group W: ‡ $P < 0.05$.