



HAL
open science

Effect of dietary lipids on fatty acid composition and fertility of fowl semen

Elisabeth Blesbois, M Lessire, D Hermier

► **To cite this version:**

Elisabeth Blesbois, M Lessire, D Hermier. Effect of dietary lipids on fatty acid composition and fertility of fowl semen. *Reproduction Nutrition Development*, 1997, 37 (3), pp.333-333. hal-00899967

HAL Id: hal-00899967

<https://hal.science/hal-00899967>

Submitted on 11 May 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Na-alginate, and for comparative purposes, pectin were fed to faecal bacteria cultured in single-stage chemostats, with pH control (6.5). Substrate (10 g.L⁻¹) was supplied for 15 days, and samples were taken for determinations of β -eliminated products, bacterial counts, isolation of alginate-degrading populations, and measurements of polyuronate depolymerase activities in bacterial cell extracts.

β -eliminated products accumulated in alginate chemostats during the initial 4 days of culture enrichment. Pectine decreased *Fusobacterium* sp populations whereas alginate selected for aerobes microorganisms. Bifidobacterial numbers were increased by alginate and decreased by pectine, however, these effects were not significant.

All alginolytic bacteria isolated among anaerobes catalysed β -elimination reactions.

Bacteria from both cultures exhibited low pectin lyase activities (ca 0.5 μ mol- β -eliminated-products mg-protein⁻¹). Conversely, high alginate lyase activity (ca 9 μ mol- β -eliminated-products mg-protein⁻¹) was specifically detected in alginate chemostats, although it was not present on the first day of culture. Hydrolase activity was high in pectin chemostats (ca 20 μ mol-reducing-ends mg-protein⁻¹), whereas reducing ends produced by cell extracts from alginate containing media corresponded only to bacterial lyase activities.

It is therefore concluded that alginate fermentation by human intestinal bacteria first requires substrate depolymerisation via β -elimination. Induction of alginate lyase and/or enrichment in alginate degrading bacterial populations may explain the latency phase observed prior to fermentation. Bacterial metabolism of β -eliminated products could also explain the lack of correlation between alginate utilization and SCFA formation.

Effect of dietary lipids on fatty acid composition and fertility of fowl semen. E Blesbois, M Lessire, D Hermier (*Inra, station de recherches avicoles, 37380 Nouzilly, France*).

Phospholipids are the major lipids (~ 80%) of spermatozoa (SPZ) and contain ~30% of *n*-6 polyunsaturated fatty acids (FA). The role of these FA on fertility has been investigated in 32 male fowls receiving isolipidic diets containing 5% of either salmon oil (salmon, *n*-6/*n*-3 = 1.1) or corn oil (corn, *n*-6/*n*-3 = 41.6). Analyses were performed on composition of spermatozoa (SPZ) and of seminal plasma (SP) and on fertilizing ability after artificial insemination. SP contained more saturated FA than SPZ, respectively 50% and 40%. SP and SPZ had high amounts of 20:4 *n*-6 (5–9%) and 22:4 *n*-6 (11–21%); these two FA were absent from the diets and partly replaced 18:2 *n*-6 in sperm (only 2–6% in sperm vs 15–46% in the diets). Moreover, when compared to the corn diet, the salmon diet increased significantly the amount of *n*-3 long-chain FA (6.7% vs 2.6%) and decreased the amount of *n*-6 long-chain FA (23.3% vs 33.3%). In parallel, the fertility rate was significantly higher with the salmon diet (96.0% vs 91.5% with the corn diet). Thus the nature of dietary FA may influence the fertilizing ability of fowl semen, probably by modifying the *n*-6/*n*-3 ratio of membrane lipids.

Additive effect of A→G (–3826) variant of the uncoupling protein gene and the Trp64Arg mutation of the β 3-adrenergic receptor gene on weight gain in morbid obesity. K Clément^{1,2}, J Ruiz^{2,4}, AM Cas-sard-Doulcier³, F Bouillaud³, D Ricquier³, A Basdevant¹, B Guy-Grand¹, P Froguel² (¹ *Département de nutrition, Hôtel-Dieu, 75004 Paris*; ² *CNRS EP 10, Institut Pasteur de Lille, 59000 Lille*; ³ *CNRS, 92000 Meudon, France*; ⁴ *Division d'endocrinologie et métabolisme, Lausanne, Switzerland*).