The effects of supplementing gestating ewe diets with DHA from algal biomass on responses of their lambs to natural parasitological challenge

E Scott-Baird, C Leifert, SA Edwards, G Butler

Newcastle University

NEFG

Introduction

- Nematodes - debilitating disease of lambs
- PPR - crucial part of epidemiology of nematode infection
- PUFAs have been shown to modify immune response in many species
- DHA shown to reduce pro-inflammatory cytokines

Objectives

- **Investigate long term effects of providing DHA from algal biomass to pregnant ewes on their lambs response to parasite challenge**

Materials and Methods 1

- **48 twin bearing ewes**
- **2*2 factorial design**

- **4 Ewe dietary treatment groups**

1. **Negative Control (-AB)**
2. **Algal Biomass (+AB) (32g/day providing 6g DHA)**
3. **Herbal Anthelmintic (-AB)**
4. **Herbal Anthelmintic plus Algal Biomass (+AB)**

Materials and Methods 2

- **Before lambing**
  - Ewes housed for 7 weeks
  - Housed in groups of 3
  - AB fed for 6 weeks pre lambing
- **After lambing**
  - Grazed in treatment groups in same split field
  - All lambs mixed at weaning (wk 18 pp)
  - Grazed on “dirty” field

Materials and Methods 3

- **Measurements**
  - Faecal egg counts (FEC)
  - Whole blood samples
  - Milk samples
  - Liveweights (LWT)
  - Condition scores (CS)

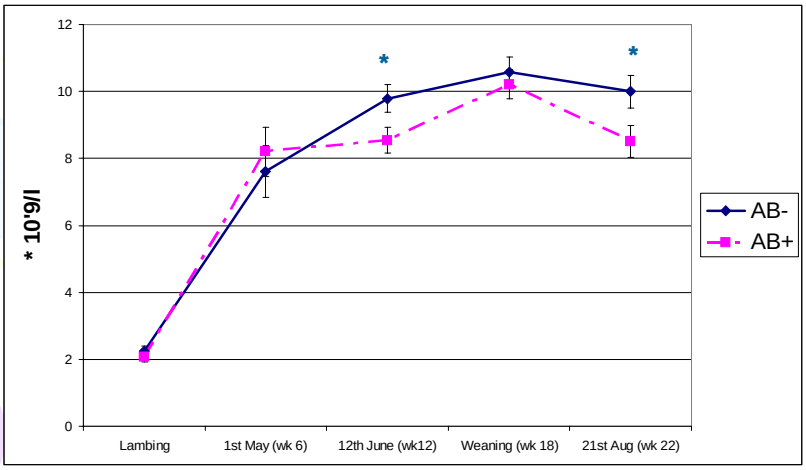
Results Ewes

- No significant effects on FEC
- AB+ group had:
  - Elevated DHA in milk wk 3 post lambing
  - Elevated DHA in plasma wk 6 post lambing

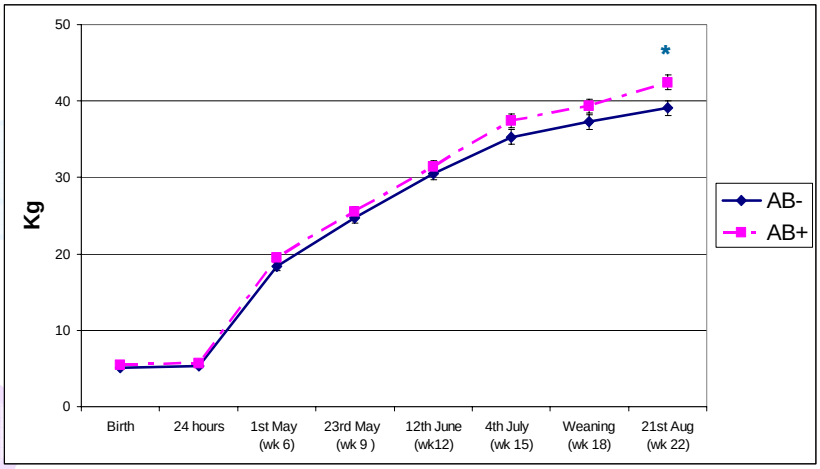
Results Lambs

- No significant effect FEC
- AB+ group had:
  - Higher levels DHA wk 6 post partum
  - Lower levels lymphocytes wk 12 and wk 22 post partum
  - Higher LWT & CS wk 22 post partum

Lamb Lymphocytes



Lamb Liveweights



Conclusions

- **Lower lymphocyte levels indicate less inflammation**
- **Therefore DHA may have**
  - **reduced the extent of a hypersensitive inflammatory reaction**
  - **reduced hypophagia**
  - **given higher resilience of lambs to nematode challenge**

Acknowledgements

- **Red Meat Industry Forum**
- **ABN (Europe)**

Any Questions?