

MONSANTO

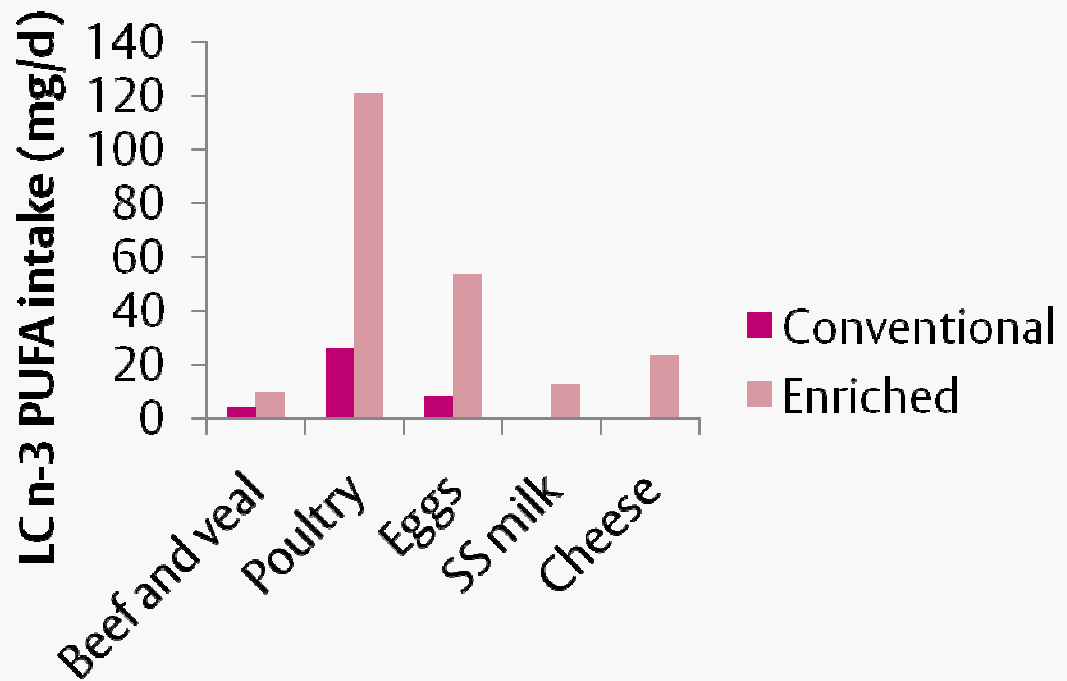


The effect of feeding stearidonic acid enriched soya oil to broilers on the fatty acid composition and sensory characteristics of chicken meat

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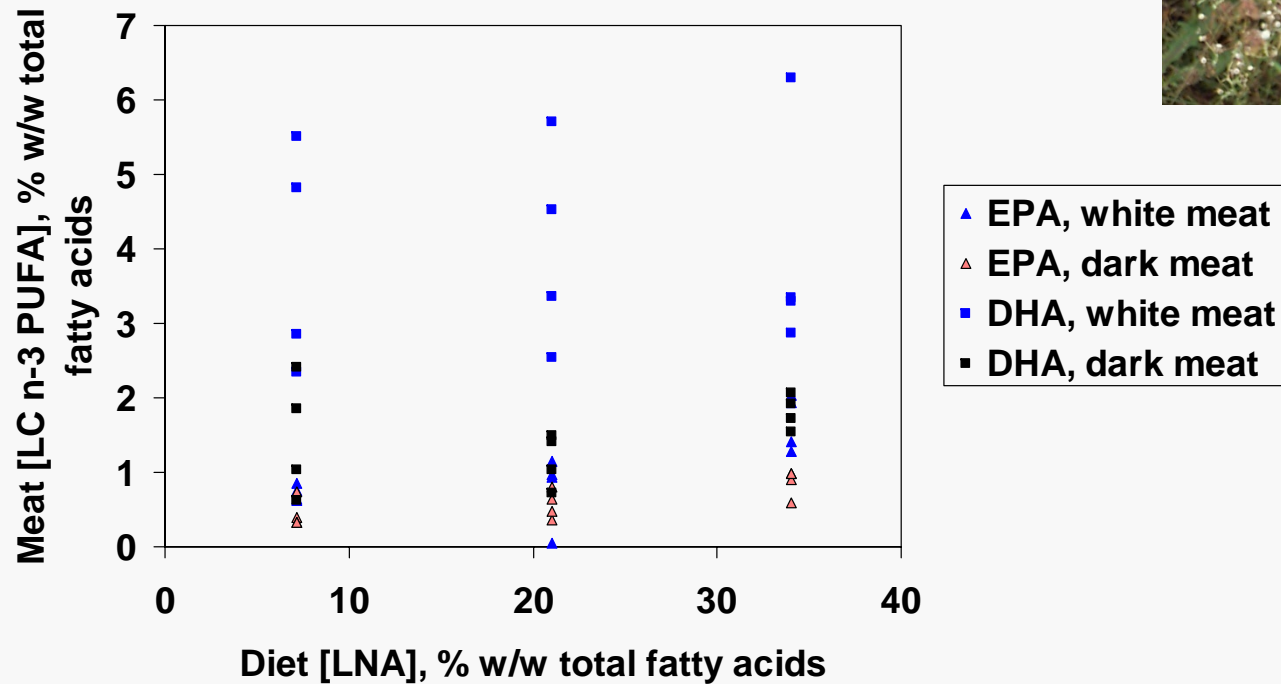
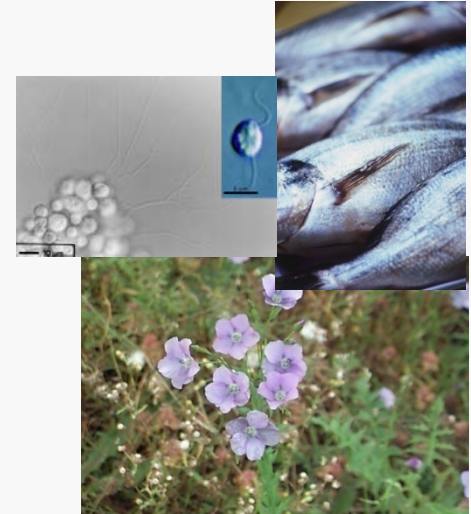
Background

- Long chain n-3 polyunsaturated fatty acid (LC n-3 PUFA) intakes in western diets sub-optimal (min. 450 mg/d recommended)
- Enriching poultry meat with LC n-3 PUFA is a viable means of increasing intakes

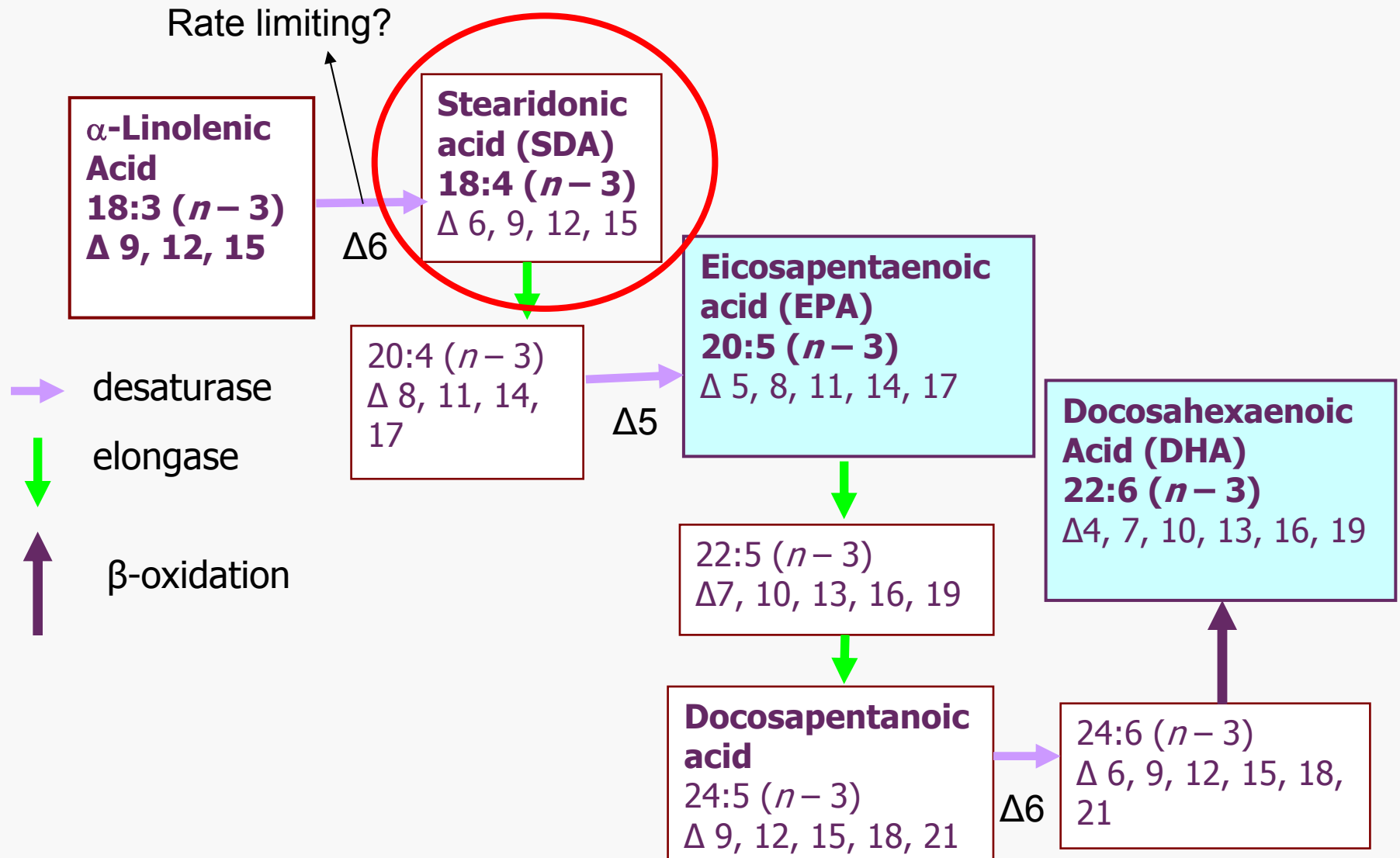


Sources of LC n-3 PUFA for broilers

- Fish oil and single cell organisms
- Cost and taint
- Enrichment with LNA precursor?



Enrichment with SDA



Enriching diets with SDA

Humans:

- | No accumulation of SDA
- | Increased plasma concentrations of EPA



Poultry?



Sources:

- | Echium
- | GM soya



Oxidative stability?

Objectives

Determine the effect of feeding SDA-enriched soya oil to broilers on their meat's:

- Fatty acid composition
- Sensory characteristics



Materials and Methods

- Male Ross 308 day old chicks (120)
- Reared as single group on common starter diet (conventional soya oil)
- Weighed at 15 d
- Randomly allocated to pens (24)
- 5 birds per pen
- Pens in blocks of 3
- Within blocks, pens randomly allocated to diets (3)
- 15-28 d: grower diet
- 29 d: finisher diet
- Weighed at 41 d
- Sacrificed in blocks from 41-50 d



Diets

- Within a phase: same formulation apart from oil.
- Grower phase: 45 g/kg oil
- Finisher phase: 50 g/kg oil

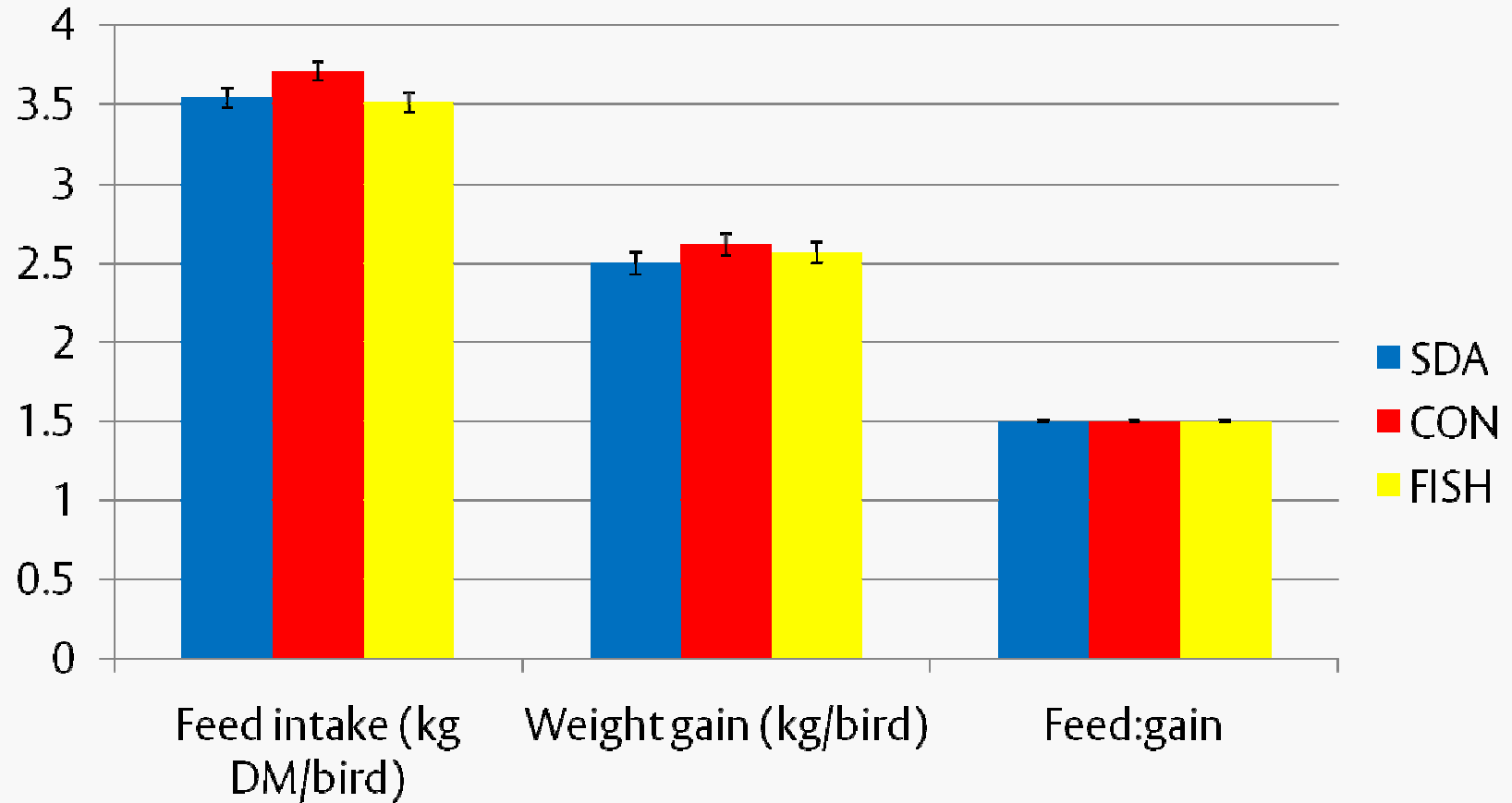
Oils used:

- SDA soya
- CON soya (near isogenic)
- FISH

Samples

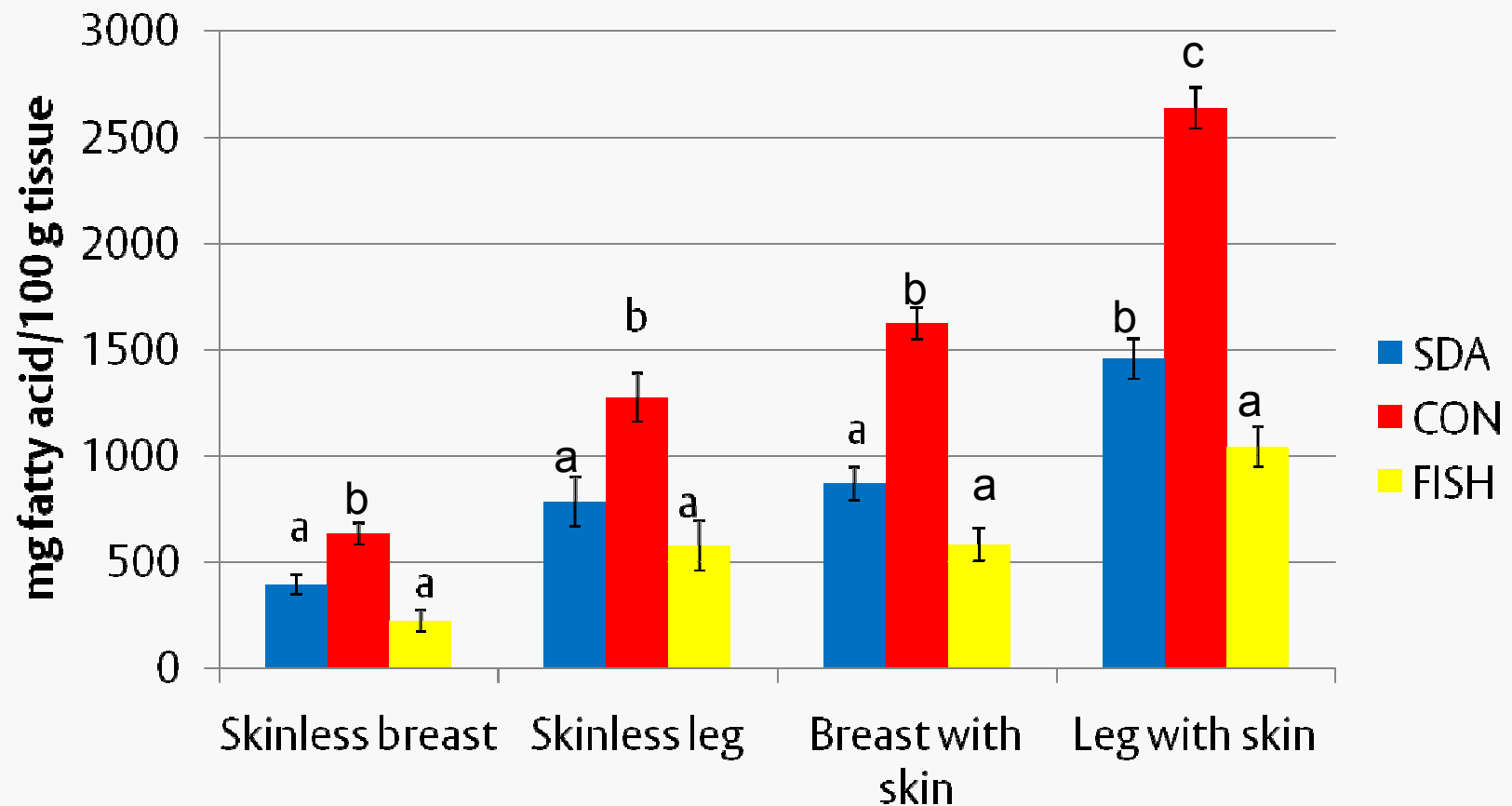
- Birds slaughtered in blocks between 41-50 d
- Skinless breast meat, skinless leg meat, skin (leg and breast) weighed.
- Samples of leg skin and skinless breast and leg meat taken from each bird.
- Bulked by pen: analysed for fatty acids
- Bulked by treatment (skinless breast and leg meat): sensory analysis.
- Sensory analysis: quantitative descriptive analysis of freshly cooked breast and leg meat and reheated leg meat

Results



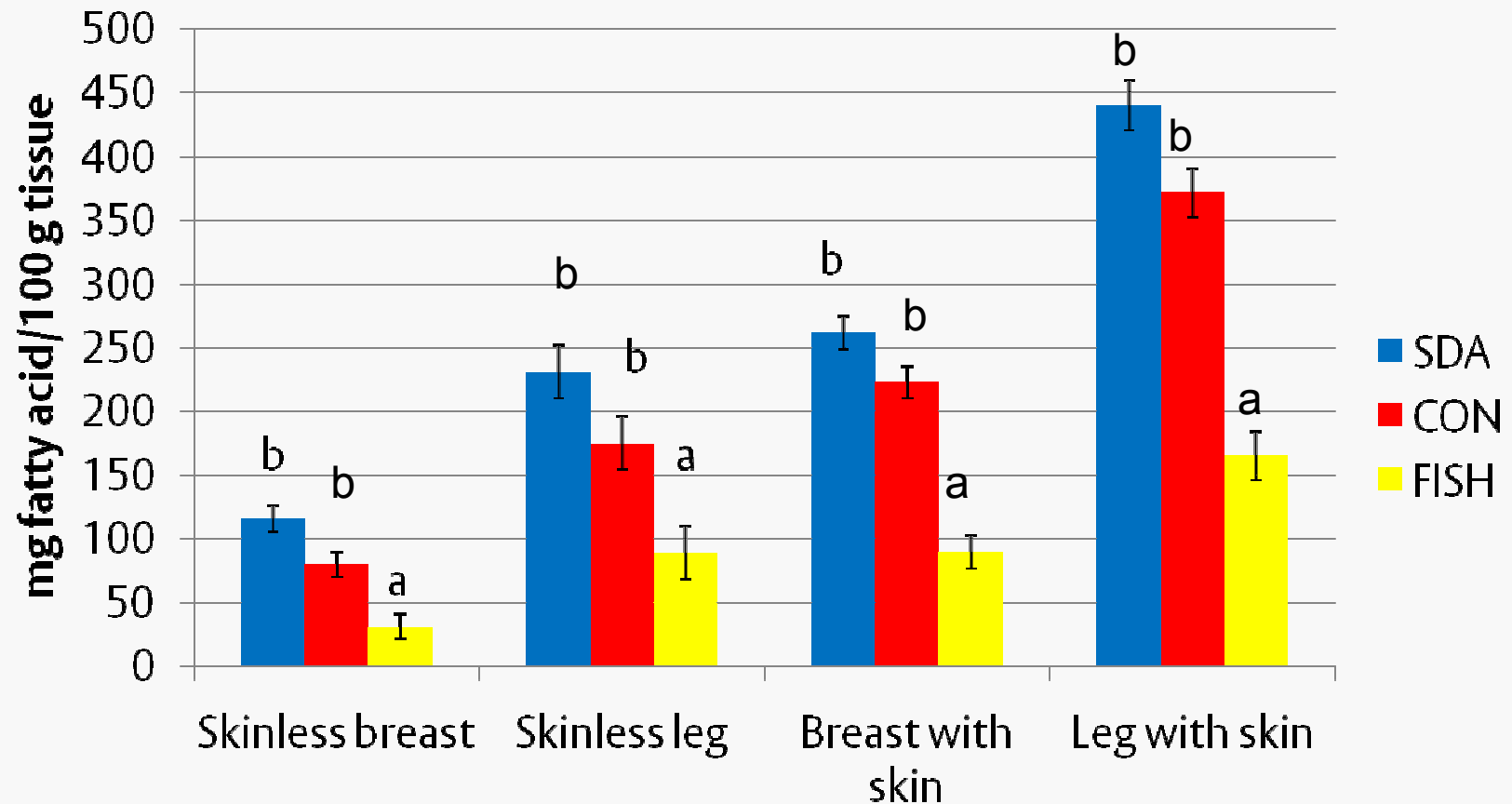
No effect on performance from 15-41 d

C18:2 n-6 content



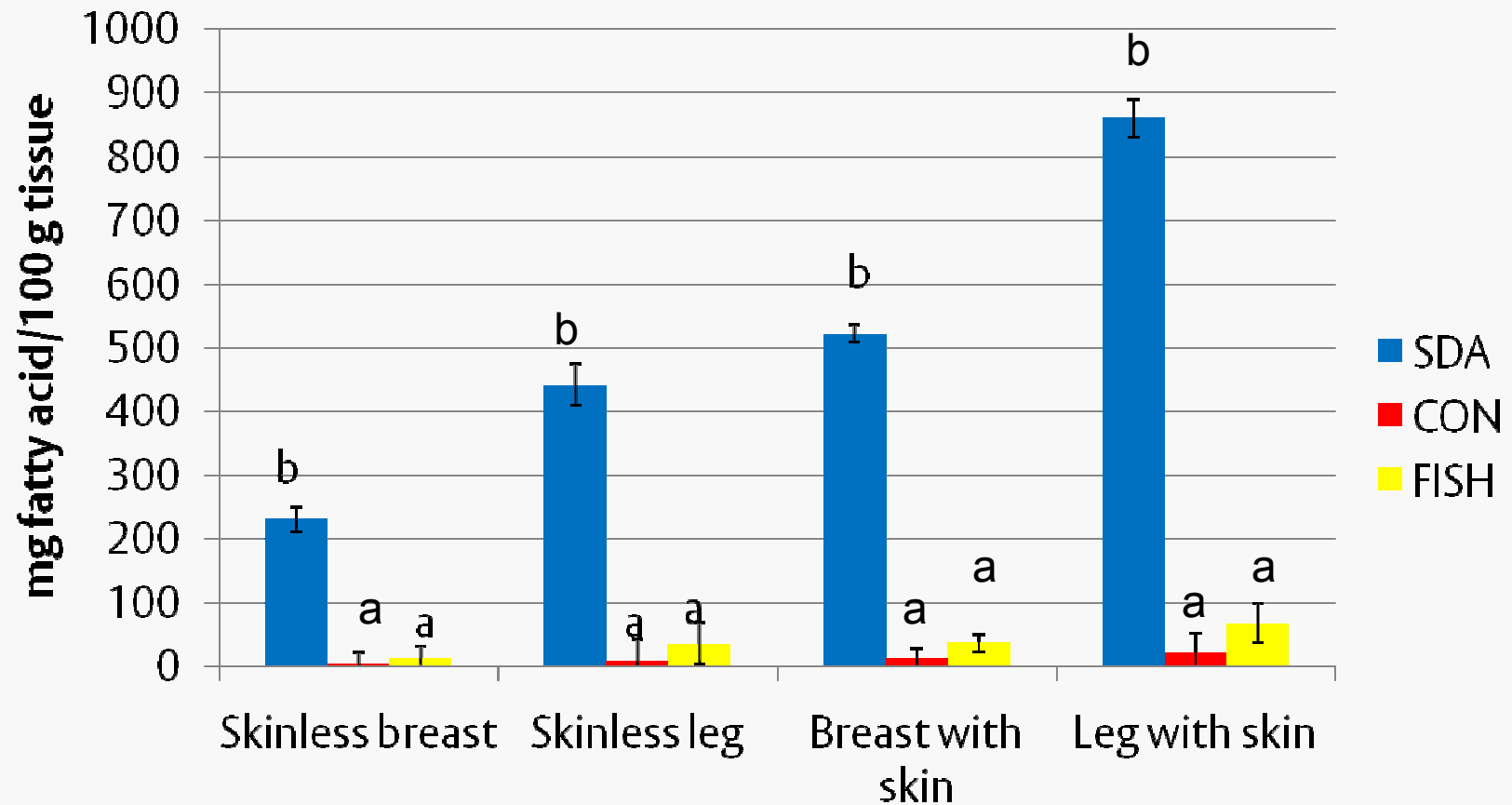
•CON soya produces meat with a high C18:2 n-6 content

C18:3 n-3 content



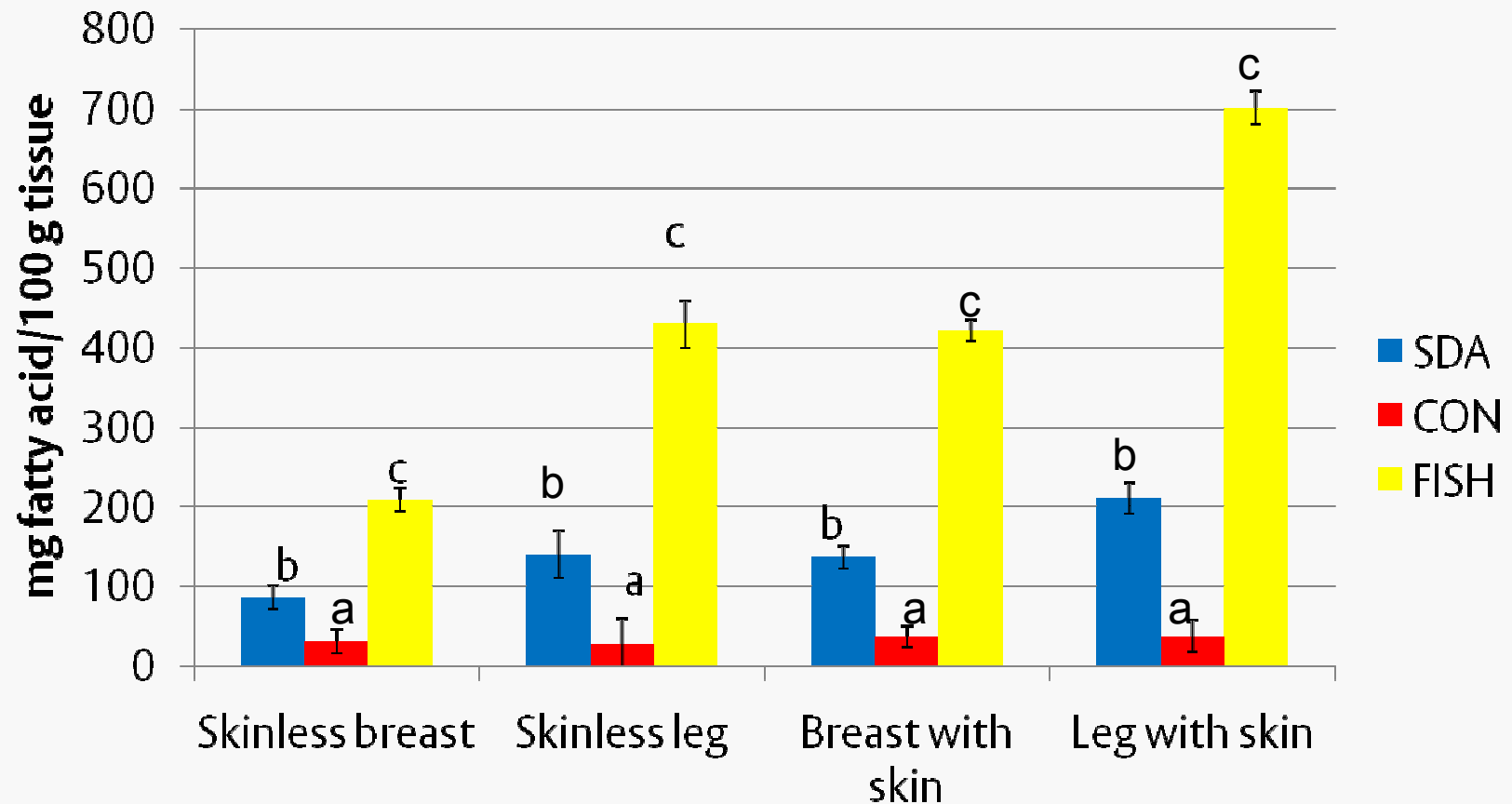
- FISH produces meat with a low C18:3 n-3 content

C18:4 n-3 content



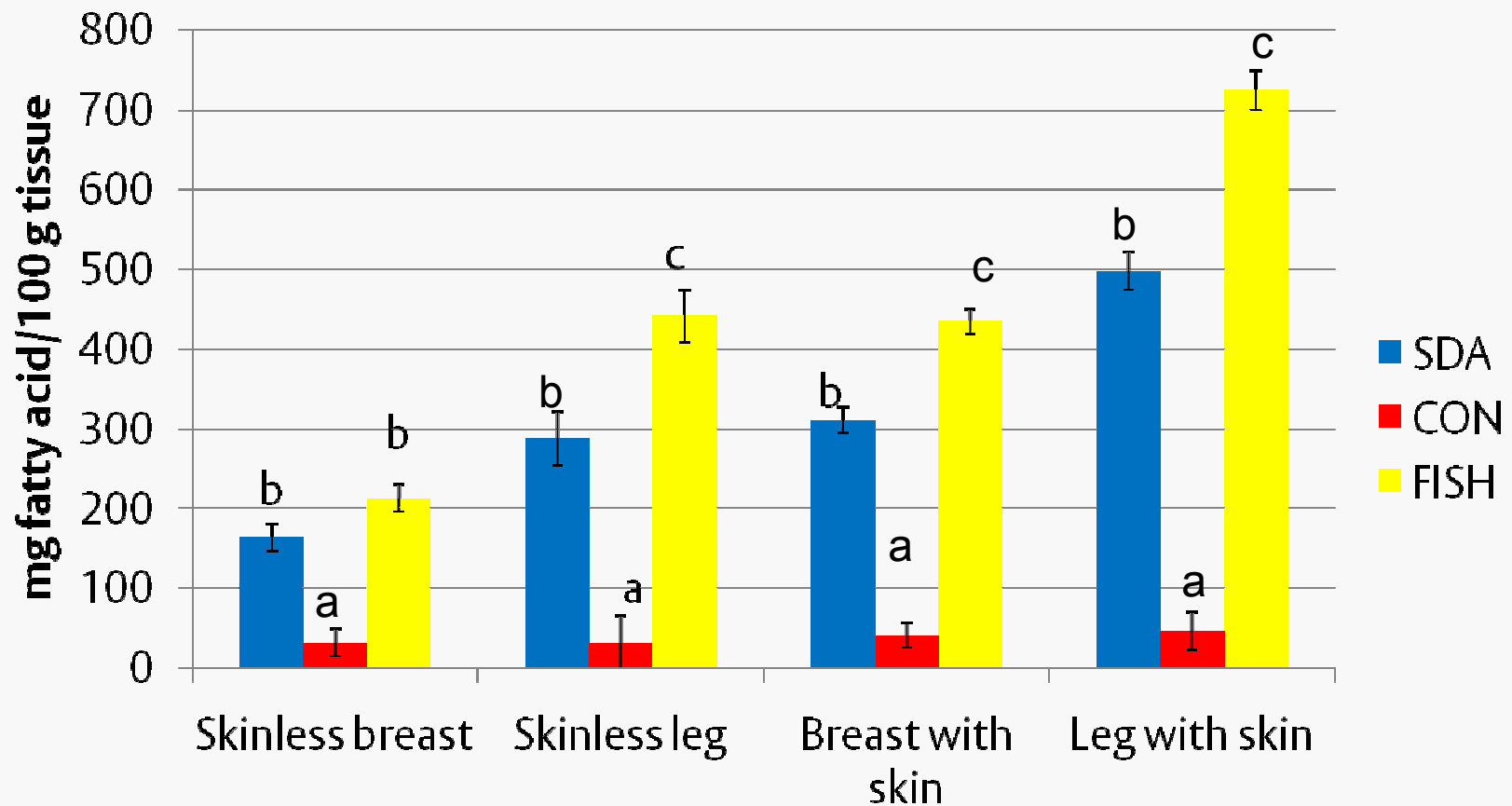
- High C18:4 n-3 content with SDA

LC n-3 PUFA content



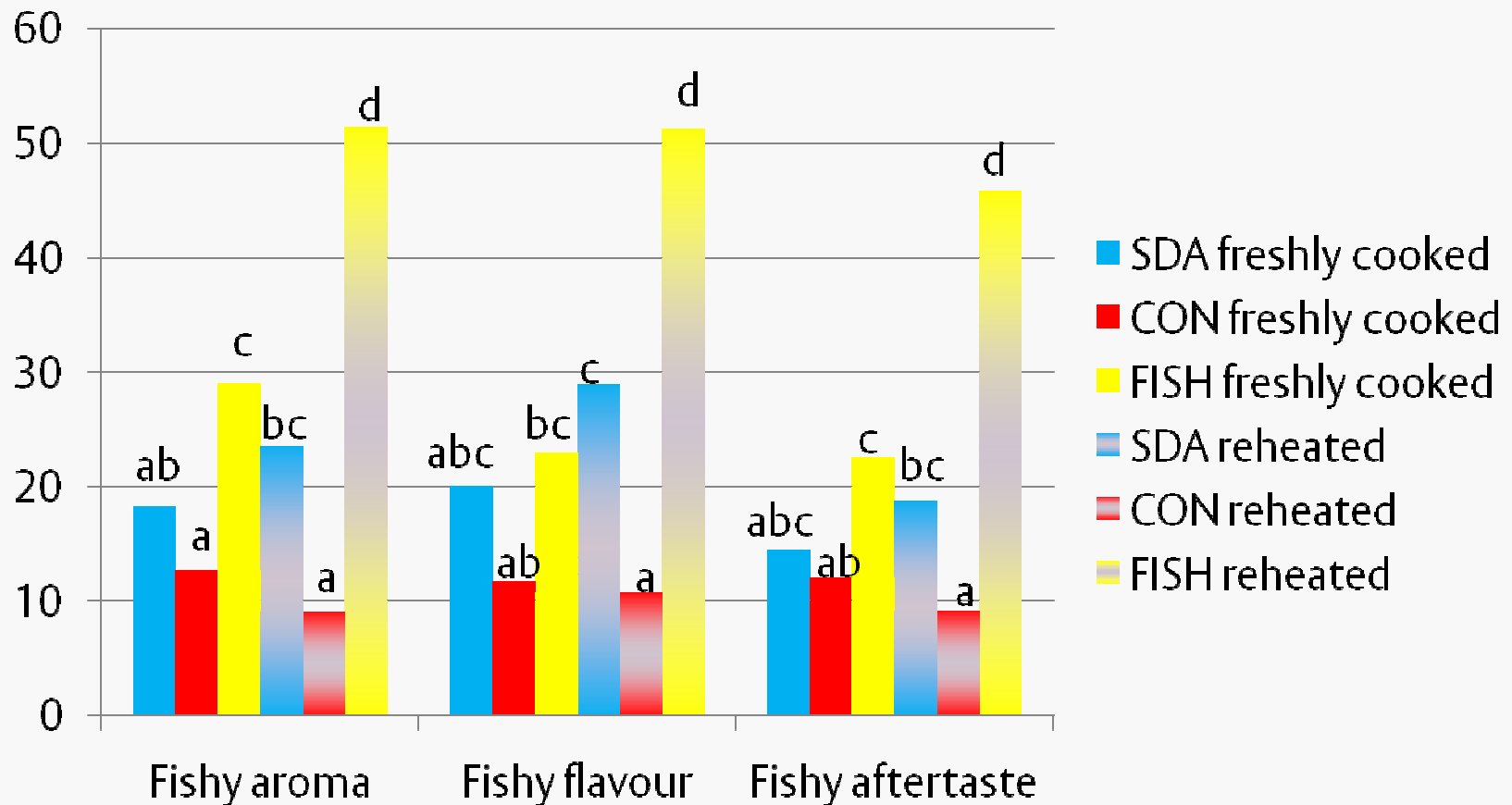
- SDA intermediate between CON and FISH

LC n-3 PUFA equivalents content



•SDA meat provides approx. 300 mg LC n-3 PUFA equivalents/ 100 g serving

Sensory attributes of leg meat



- No effect of treatment on taste of breast meat.

Conclusions

- Feeding broilers a soya oil rich in SDA produced meat with approximately 150-200 mg LC n-3 PUFA/100 g meat (with skin).
- Broilers deposited SDA in their meat (520-860 mg/100 g)
- Meat from birds fed SDA had much less taint than meat from birds fed FISH (especially when reheated).
- SDA-rich oil is a viable means of enriching poultry meat with LC n-3 PUFA and its immediate precursors

