

CYAnobacterial platform Optimised for bioproduction

Astaxanthin enriched fish feed

Nicoletta Guerrieri, Simona Musazzi, Andrea Lami

CNR – Istituto di Ricerca sulle Acque, Verbania

CYAO Closure Meeting

15 June 2021 – IRSA CNR, Verbania

Fondazione
CARIPLO



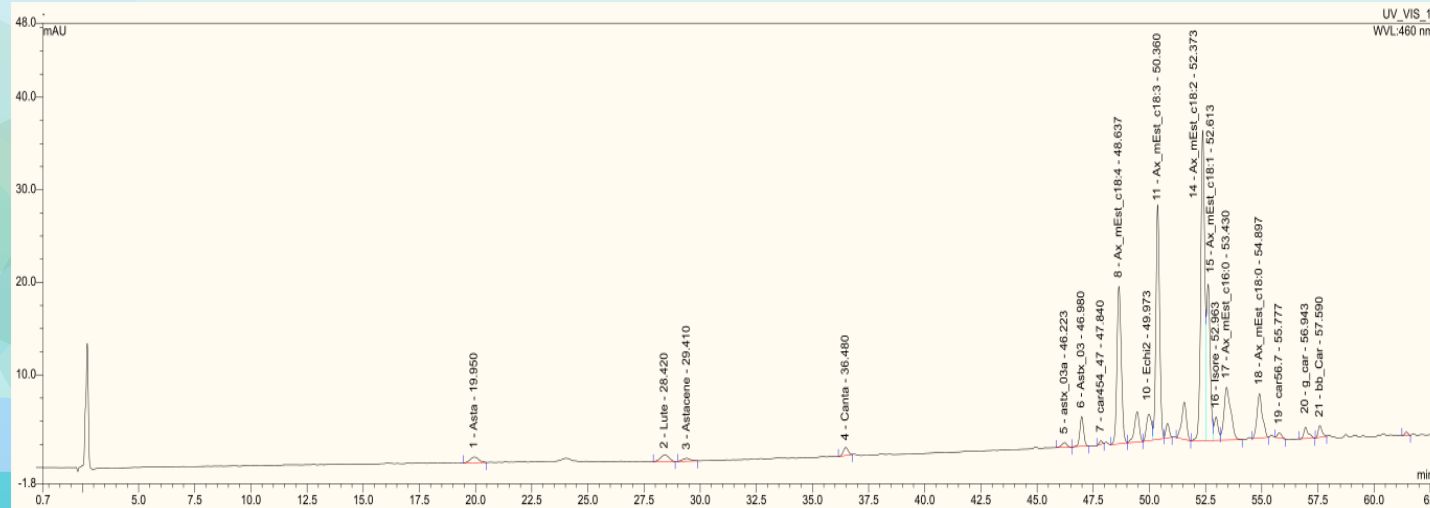
Consiglio Nazionale delle Ricerche



Haematococcus pluvialis

-Carotenoid content 24 mg/g d.w.

-96% of the total carotenoid is Astaxanthin



CYAO Closure Meeting

15 June 2021 – IRSA CNR, Verbania

Fondazione
CARIPLO



Consiglio Nazionale delle Ricerche



Experiment optimization

-Different test to optimize the extraction ratio

-0.1g liophylized *Haematococcus pluvialis* were extracted in 20 ml sunflower oil, in dark and nitrogen atmosphere for 12hs.

-80% recovery





Pellet fish feed

Commercial pellet: **Aller artic** 4.5mm

Composition

Protein 46%

Fat 25.2%

Polysaccharide 14.5%

Fiber 1.2%

ash 8.1%

P total 1.1%, Na total 0.5%, Ca total 1.6%

vit A (retinol E672) 10000 IU/kg

vit D(cholecalc.) 1250 IU/kg

I (Ca iodized E2) 3mg/kg

Cu (Cu sulfate E4) 5 g/kg

Mn (Mn sulfate E5) 12 mg/kg

Zn (Zn sulfate E6) 100mg/kg

BHT (E321) 70ppm, BHA(E320) 45ppm

CYAO Closure Meeting

15 June 2021 – IRSA CNR, Verbania

Fondazione
CARIPLO



Consiglio Nazionale delle Ricerche



Enriched pellet preparation A and B

Milling

Mixing with water and oil

Extrusion

Cutting

Drying

Aliquotated

Storage

Daily fish feed trial for 7 months

CYAO Closure Meeting

15 June 2021 – IRSA CNR, Verbania

Fondazione
CARIPLO



Consiglio Nazionale delle Ricerche



Fish feed

A enriched
(with astaxanthin 0.002%)

500g milled pellet +
10g sunflower oil (+Astax)+
270ml deionized water



B control

(without astaxantin)

500g milled pellet +
10g sunflower oil +
270ml deionized water



Operational flow chart

Pellet Milling
(Bimby, 17'')



Mixing and extrusion
(Philiphs, Pasta Maker, 3')



Cutting pellet, 2cm



Drying in ventilated oven,
40°C, 48hs



Aliquotation (daily feed)
and Storage (-20°C)

CYAO Closure Meeting

15 June 2021 – IRSA CNR, Verbania

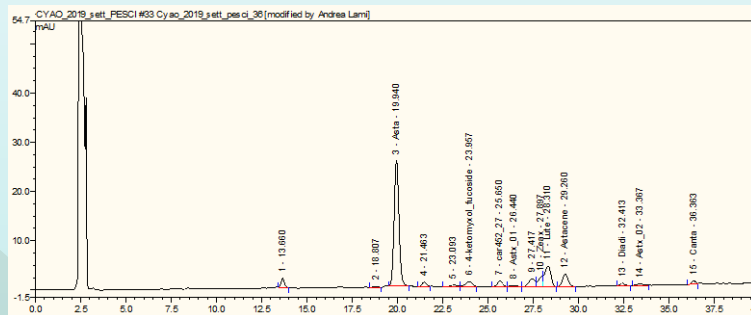
A1 T6



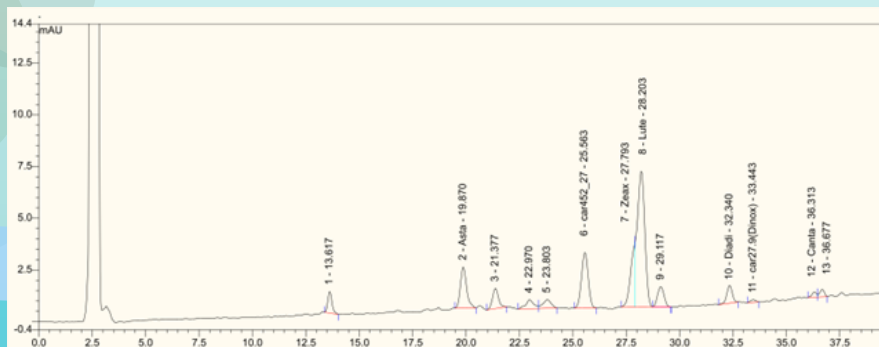
New insights

Hard roe
Carotenoid extraction

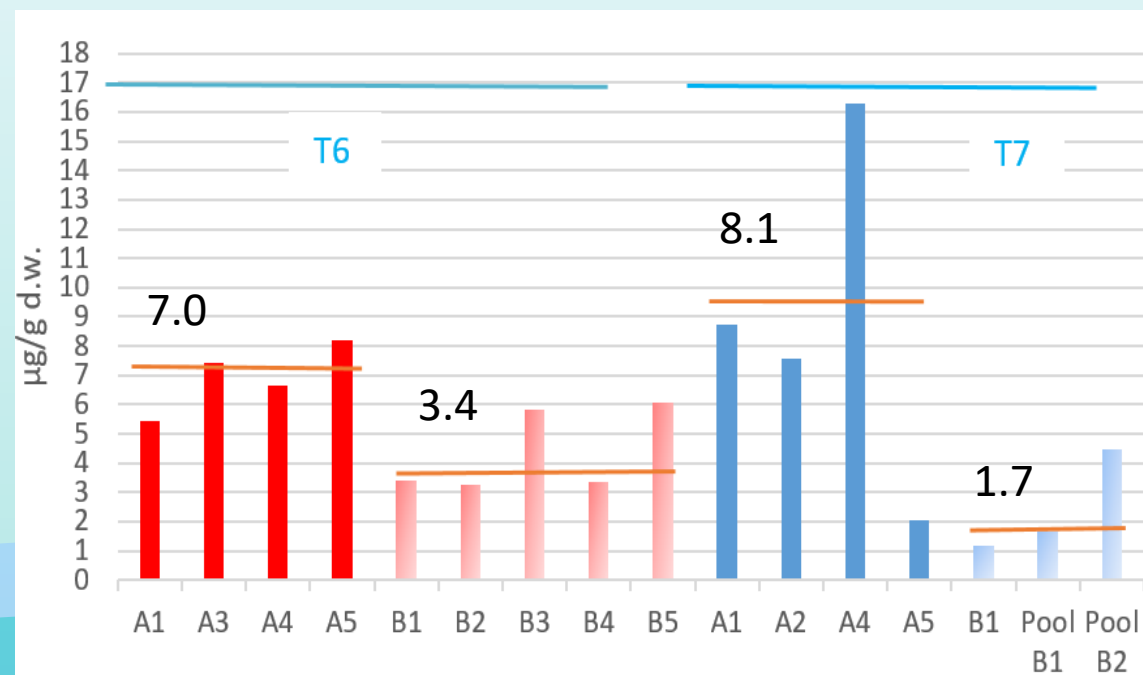
T3 A Hard roe



B4 T6



T2 B Hard roe



New insights

FT-IR in collaboration with Silvia Galafassi

FT-IR spectra of fish flesh and hard roe

