Analysis of whole green crab protein and its suitability for finfish feeds

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Methods
Nutritional Profile of whole green crab
Carcinus maenas

- Three random 1.86 kg samples of whole green crabs
- Selected from the center of three separate traps

(Hampton-Seabrook Estuary, N.H.)

- Snap-frozen on dry ice
- Subjected to nutritional analysis at New Jersey Feed Labs

(Ewing,N.J.)

Sample preparation, analysis

- Samples finely pulverized in a Mikro-pul sample mill
- 14 g of each sample reserved for testing.
- Parameters tested:
  - Proximate analysis
  - Calcium, phosphorus, zinc, and mercury content
  - Amino acid profile
  - Fatty acid profile

Results (Proximate; Mineral)

Item	Green crab % wet weight basis, except Hg (ppm)	Menhaden (*Brevoortia* spp.) Values (From Literature) % wet weight basis, except Hg (ppm)
Moisture content	67.96	[a]67.70
Protein	7.45*	[a]15.00
Lipid	0.21	[a]13.50
Fiber	2.87	Not Available
Ash	16.55	[a]4.40
Calcium	5.70	[b]1.29
Potassium	0.22	[b]0.21
Zinc	3.778*10^-4	[b]67
Mercury	<5*10^-6	[b]1.98**

*Based on amino acid analysis, not total nitrogen (to which chitin contributes)

**Mercury value from Scott and Latshaw (1993) is an average of all tissues sampled, as whole fish data was not provided.

[a] Reference value from Lanier et al., 1983

[b] Reference value from Scott and Latshaw, 1993

Results (Fatty Acids)

Lipid component	Green crab (% of total lipid)	Menhaden (*Brevoortia* spp.) Values (From Literature) (% of total lipid)
Saturated fat	23.29	30.40
Unsaturated fat	67.98	54.60
Eicosapentanoeic acid (EPA, 20:5ω3)	8.73	13.50
Docosahexanoic acid (DHA, 22:6ω3)	7.69	7.00
Arachidonic acid (ARA, 20:4ω6)	2.58	1.00
Linoleic acid (18:2ω6)	3.06	1.10
Linolenic acid (18:3ω3)	0.79	0.80

[a]Fatty acid values for oil (also % of total oils) for menhaden are 1982 year totals from Joseph (1985).

Results (Amino Acids)

Amino acid	Green crab (% of total AA)	Menhaden (*Brevoortia* spp.) Values (From Literature) (% of total AA)
Phenylalanine[f] [c]	3.98	3.52
Valine[f] [c]	9.98	5.04
Threonine[f] [c]	3.76	4.21
Tryptophan[f] [c]	0.27	1.14
Isoleucine[f] [c]	4.39	4.15
Methionine[f] [c]	2.24	2.48
Histidine[f] [c]	2.01	2.14
Arginine[f] [c]	6.22	5.94
Leucine[f] [c]	6.13	7.47
Lysine[f] [c]	4.88	8.45
Cystine [c]	0.81	0.96

Values for protein hydrolysate of menhaden, reported as average % of protein (g/16g N), are from Hale and Bauersfield, 1978. Also noted are amino acids essential to fish[f] and chickens[c].

Conclusion

- Meal made from whole green crab would likely be palatable to many species of finfish

- Whole green crab is a good candidate for partial fishmeal replacement for ash tolerant species (ie: Cod *Gadus morhua* or cobia *Rachycentron canadum*)

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Images:

- http://www.exoticsguide.org/node/37
- http://www.marinespecies.org/photogallery.php?album=717&pic=39619