AQUACULTURE I

3. WEEK

AQUACULTURE: ANIMAL PROTEIN

WEEKLY TOPICS

WEEK	TOPICS
1. WEEK	WHAT IS AQUACULTURE?
2. WEEK	IMPORTANCE OF AQUACULTURE
3. WEEK	AQUACULTURE: ANIMAL PROTEIN
4. WEEK	HISTORY OF AQUACULTURE
5. WEEK	ORGANISATION OF AQUACULTURE
6. WEEK	CHARACTERISTICS OF AQUACULTURE
7. WEEK	POND CULTURE
8. WEEK	IN STATIC FRESHWATER PONDS
9. WEEK	IN BRACKISH-WATER PONDS
10. WEEK	RUNNING WATER CULTURE
11. WEEK	CULTURE IN RE-CIRCULATORY SYSTEMS (RAS)
12. WEEK	AQUACULTURE IN RACEWAYS, CAGES, AND ENCLOSURES
13. WEEK	MONOCULTURE AND POLYCULTURE
14. WEEK	RECENT ADVANCES IN AQUACULTURE

- Almost all fish meal is produced by the wet reduction method in which the principal operations are cooking, pressing, separation of the oil and water emulsion with recovery of oil, drying of the residual protein material and grinding. This is accomplished in machinery designed for this purpose. During the pressing operation the aqueous portion (stickwater) and the largest portion of the lipid component are removed from the raw material. The remaining portion is known as the press cake. The oil and-water emulsion is then separated and the water portion partially condensed. It may or may not be returned to the press cake to make a whole fish meal. The oil is collected and may be further processed into specific products

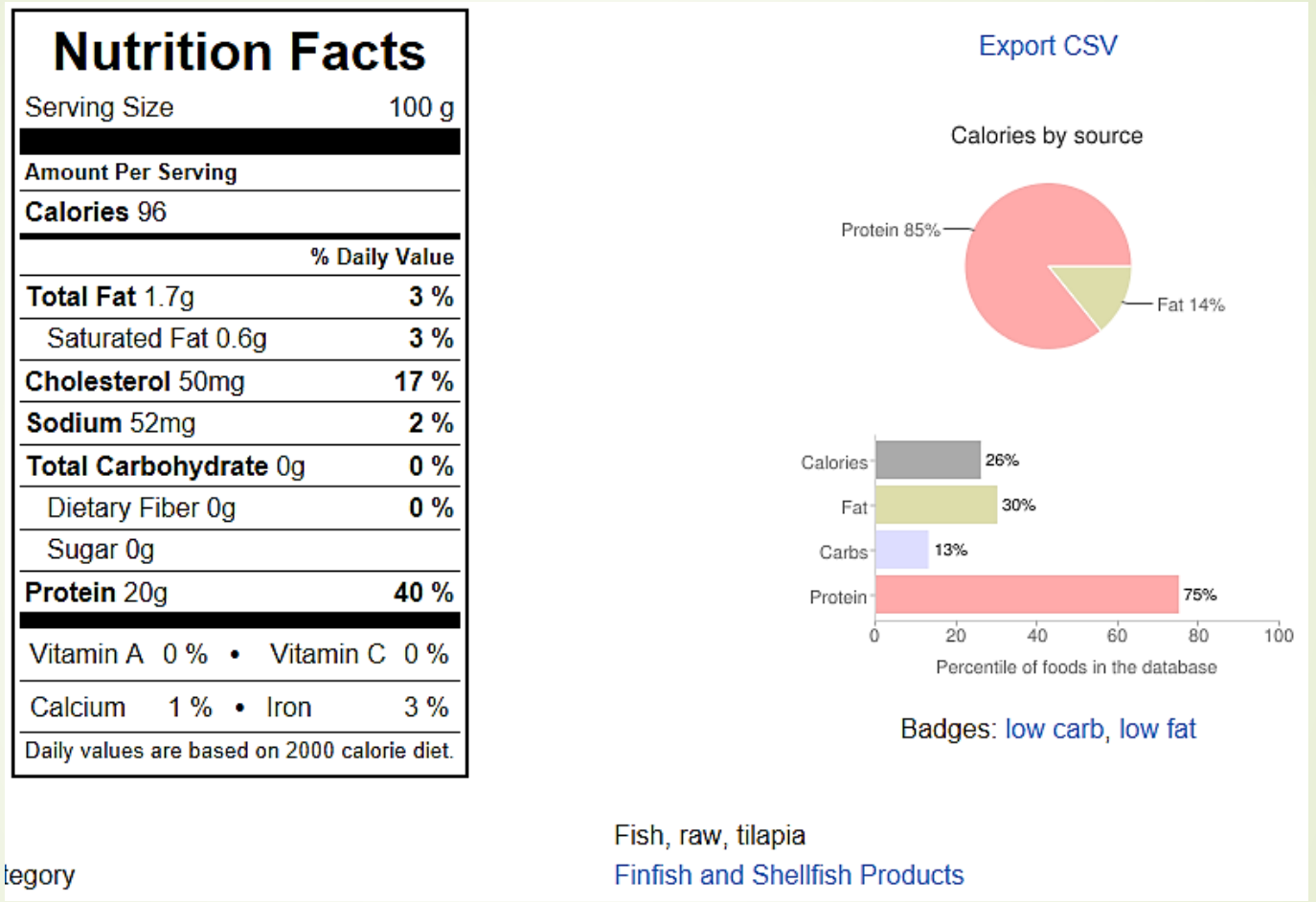
Fuller, M. F. (Ed.). (2004). *The encyclopedia of farm animal nutrition*. Cabi.

- Fish meal is usually a brown powder that normally contains a high level of protein and appreciable quantities of fat and minerals. It contains a higher level of lysine and sulphur amino acids than oilseed meals. White fish meal has a lower oil content and slightly higher mineral content than other types.

Fuller, M. F. (Ed.). (2004). *The encyclopedia of farm animal nutrition*. Cabi.

- There are fishery by-products other than fish meal but their commercial production is limited. Crab process residue meal (or crab meal) consists of the undecomposed ground dried waste of crab and contains the shell, viscera and part or all of the flesh.

Fuller, M. F. (Ed.). (2004). *The encyclopedia of farm animal nutrition*. Cabi.



Nutrition Facts

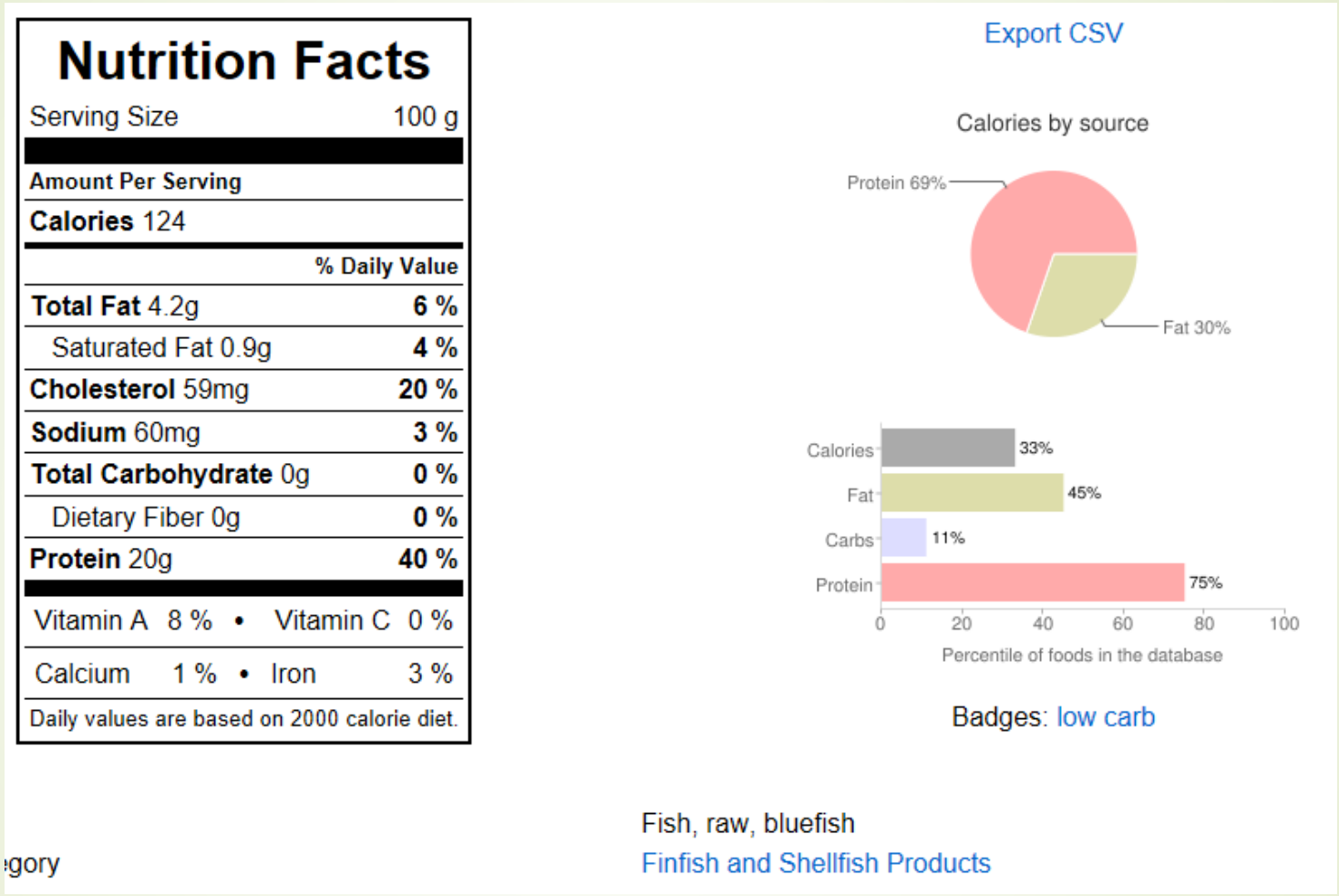
Serving Size	100 g
Amount Per Serving	
Calories 96	
	% Daily Value
Total Fat 1.7g	**3 %**
Saturated Fat 0.6g	**3 %**
Cholesterol 50mg	**17 %**
Sodium 52mg	**2 %**
Total Carbohydrate 0g	**0 %**
Dietary Fiber 0g	**0 %**
Sugar 0g	
Protein 20g	**40 %**

Vitamin A 0 % • Vitamin C 0 %

Calcium 1 % • Iron 3 %

Daily values are based on 2000 calorie diet.

https://www.nutritionvalue.org/search.php?food_query=Fish%2C+raw



Nutrition Facts

Serving Size	100 g
Amount Per Serving	
Calories 124	
	% Daily Value
Total Fat 4.2g	**6 %**
Saturated Fat 0.9g	**4 %**
Cholesterol 59mg	**20 %**
Sodium 60mg	**3 %**
Total Carbohydrate 0g	**0 %**
Dietary Fiber 0g	**0 %**
Protein 20g	**40 %**

Vitamin A 8 % • Vitamin C 0 %

Calcium 1 % • Iron 3 %

Daily values are based on 2000 calorie diet.

https://www.nutritionvalue.org/search.php?food_query=Fish%2C+raw

Fish, raw, bluefish nutrition facts and analysis per serving

Vitamins

Nutrient	Amount	DV
Folate	2.00 mcg	
Folic acid	0.00 mcg	
Niacin	5.950 mg	30 %
Pantothenic acid	0.626 mg	8 %
Riboflavin	0.080 mg	5 %
Thiamin	0.056 mg	4 %
Vitamin A	398.00 IU	8 %
Vitamin A, RAE	120.00 mcg	
Vitamin B12	5.39 mcg	90 %
Vitamin B6	0.402 mg	20 %
Vitamin C	0.0 mg	0 %

Minerals

Nutrient	Amount	DV
Calcium, Ca	7.00 mg	1 %
Copper, Cu	0.053 mg	3 %
Iron, Fe	0.48 mg	3 %
Magnesium, Mg	33.00 mg	8 %
Manganese, Mn	0.021 mg	1 %
Phosphorus, P	227.00 mg	23 %
Potassium, K	372.00 mg	8 %
Selenium, Se	36.5 mcg	52 %
Sodium, Na	60.00 mg	3 %
Zinc, Zn	0.81 mg	5 %

Proteins and Aminoacids

Nutrient	Amount	DV
Protein	20.04 g	40 %
Alanine	1.212 g	
Arginine	1.199 g	
Aspartic acid	2.052 g	
Cystine	0.215 g	
Glutamic acid	2.991 g	
Glycine	0.962 g	
Histidine	0.590 g	
Isoleucine	0.923 g	66 %
Leucine	1.629 g	60 %
Lysine	1.840 g	88 %
Methionine	0.593 g	56 %
Phenylalanine	0.782 g	45 %
Proline	0.709 g	
Serine	0.818 g	
Threonine	0.878 g	84 %
Tryptophan	0.224 g	80 %
Tyrosine	0.676 g	39 %
Valine	1.032 g	57 %

Carbohydrates

Nutrient	Amount	DV
Carbohydrate	0.00 g	0 %
Fiber	0.0 g	0 %

Fats and Fatty Acids

Nutrient	Amount	DV
Fat	4.24 g	7 %
Saturated fatty acids	0.915 g	5 %
Butanoic acid	0.000 g	
Decanoic acid	0.000 g	
Dodecanoic acid	0.000 g	
Hexadecanoic acid	0.576 g	
Hexanoic acid	0.000 g	
Octadecanoic acid	0.160 g	
Octanoic acid	0.000 g	
Tetradecanoic acid	0.179 g	
Monounsaturated fatty acids	1.793 g	
Docosenoic acid	0.492 g	
Eicosenoic acid	0.340 g	
Hexadecenoic acid	0.277 g	
Octadecenoic acid	0.684 g	
Polyunsaturated fatty acids	1.060 g	
Docosahexaenoic n-3 acid	0.519 g	
Docosapentaenoic n-3 acid	0.062 g	
Eicosapentaenoic n-3 acid	0.252 g	
Eicosatetraenoic acid	0.000 g	
Octadecadienoic acid	0.060 g	
Octadecatetraenoic acid	0.167 g	
Octadecatrienoic acid	0.000 g	

Sterols

Nutrient	Amount	DV
Cholesterol	59.00 mg	20 %

Other

Nutrient	Amount	DV
Alcohol, ethyl	0.0 g	
Ash	1.04 g	
Water	70.86 g	

Foods related to fish, raw, bluefish

https://www.nutritionvalue.org/search.php?food_query=Fish%2C+raw

Cooked (by moist or dry heat with no added ingredients), edible weight portion. Percent Daily Values (%DV) are based on a 2,000 calorie diet.

Seafood Serving Size (84 g/3 oz)	Calories	Calories from Fat	Total Fat g	%DV	Saturated Fat g	%DV	Cholesterol mg	%DV	Sodium mg	%DV	Potassium mg	%DV	Total Carbohydrate g	%DV	Protein g	Vitamin A %DV	Vitamin C %DV	Calcium %DV	Iron %DV
Blue Crab	100	10	1	2	0	0	95	32	330	14	300	9	0	0	20g	0%	4%	10%	4%
Catfish	130	60	6	9	2	10	50	17	40	2	230	7	0	0	17g	0%	0%	0%	0%
Clams, about 12 small	110	15	1.5	2	0	0	80	27	95	4	470	13	6	2	17g	10%	0%	8%	30%
Cod	90	5	1	2	0	0	50	17	65	3	460	13	0	0	20g	0%	2%	2%	2%
Flounder/Sole	100	15	1.5	2	0	0	55	18	100	4	390	11	0	0	19g	0%	0%	2%	0%
Haddock	100	10	1	2	0	0	70	23	85	4	340	10	0	0	21g	2%	0%	2%	6%
Halibut	120	15	2	3	0	0	40	13	60	3	500	14	0	0	23g	4%	0%	2%	6%
Lobster	80	0	0.5	1	0	0	60	20	320	13	300	9	1	0	17g	2%	0%	6%	2%
Ocean Perch	110	20	2	3	0.5	3	45	15	95	4	290	8	0	0	21g	0%	2%	10%	4%
Orange Roughy	80	5	1	2	0	0	20	7	70	3	340	10	0	0	16g	2%	0%	4%	2%
Oysters, about 12 medium	100	35	4	6	1	5	80	27	300	13	220	6	6	2	10g	0%	6%	6%	45%
Pollock	90	10	1	2	0	0	80	27	110	5	370	11	0	0	20g	2%	0%	0%	2%
Rainbow Trout	140	50	6	9	2	10	55	18	35	1	370	11	0	0	20g	4%	4%	8%	2%
Rockfish	110	15	2	3	0	0	40	13	70	3	440	13	0	0	21g	4%	0%	2%	2%
Salmon, Atlantic/Coho/Sockeye/Chinook	200	90	10	15	2	10	70	23	55	2	430	12	0	0	24g	4%	4%	2%	2%
Salmon, Chum/Pink	130	40	4	6	1	5	70	23	65	3	420	12	0	0	22g	2%	0%	2%	4%
Scallops, about 6 large or 14 small	140	10	1	2	0	0	65	22	310	13	430	12	5	2	27g	2%	0%	4%	14%
Shrimp	100	10	1.5	2	0	0	170	57	240	10	220	6	0	0	21g	4%	4%	6%	10%
Swordfish	120	50	6	9	1.5	8	40	13	100	4	310	9	0	0	16g	2%	2%	0%	6%
Tilapia	110	20	2.5	4	1	5	75	25	30	1	360	10	0	0	22g	0%	2%	0%	2%
Tuna	130	15	1.5	2	0	0	50	17	40	2	480	14	0	0	26g	2%	2%	2%	4%

http://dev-seafoodhealthfacts.pantheon.io/sites/default/files/FDATop20SeafoodNutritionChart2006.pdf

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