DELTA TALE

June 1988
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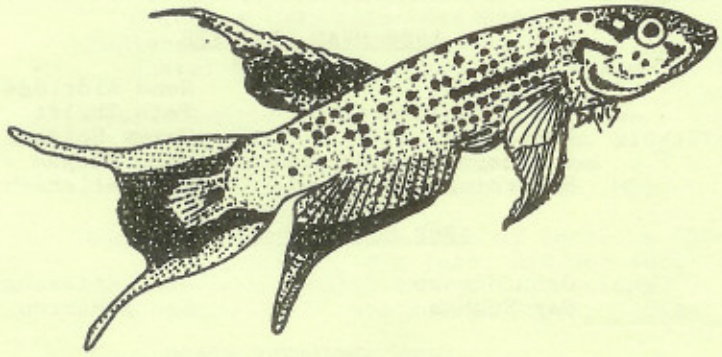

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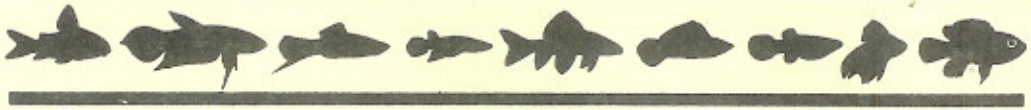

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The following list was downloaded from Fishnet - the Aquarium and Tropical Fish Forum on CompuServe Information Service. I'm leaving the header in so you can see how messages are stored and on the system. I've deleted those entries that have already passed. [Editor]

#: 28885 S8/News/Shows/Meetings
30-Mar-88 22:47:38
Sb: Meetings (Apr-May)
Fm: Sally Van Camp (FAAS) 73167,2625
To: All

This listing compliments of the Federation of American Aquarium Societies.

May 27-29	Am. Killifish Assn. 26th Annual Convention Pacifica Hotel, Los Angeles, CA
Jun 4	Los Angeles Betta Society info: (213) 462-8512
Jun 16-19	Internat'l Betta Congress Annual Convention Columbus, OH; info: 614/870-8243
Jun 25-26	Indianapolis A.S. 1988 Annual Show Chapel Glen Elem. School, Indianapolis, IN
Jul 1-3	Stark Cichlid Study Group Hall of Fame Championship - Canton, OH; info: 216/497-4055
Jul 21-24	Am. Cichlid Assn. Annual Convention Holiday Inn-Westport, St. Louis, MO; info:314/343-4253
Aug 20-21	Southwest Michigan A.S. Age of Aquarium '88 Southland Mall, MI; info: 616/385-4972
Aug 26-28	Am. Livebearer/FOTAS Annual Conventions (tentative) Hilton Hotel, Bryan, Texas
Sept 3-5	Calgary A.S. Annual Show info: 803 Allandale Rd. SE, Calgary, ALB T2H 1W7
Sept 23-25	FAAS Convention Regency Best Western, Blasdell, NY; info: 716/941-3701
Oct 1	Michigan Cichlid Assn. Fall Auction
Oct 7-10	Saskatoon Bi-Annual Public Show Saskatoon Forestry Farm Auditorium
Oct 16	Greater Detroit A.S. Fall Auction
Oct 17	Bettas of the North East Certified Show Grenich, CN
Nov 5	Motor City A.S. Fall Auction

TWO NATIVE KILLIFISH

by Kenneth Taft

Reprinted from Allegheny River Valley Aquarium Society's Aquatic Digest

I first acquired a half-dozen small specimens of Fundulus chrysotus, the golden-eared killifish from a mini-auction held at one of our club's monthly meetings. They averaged about one inch in length and had a wa to go in order to reach maturity. During the first year I had them, they were kept, at various times, in plastic sweater boxes and in a couple of different community tanks.

The golden-eared killie is a rather shy fish and appreciate [sic] the thick cover of a well planted tank, whether the plants are real or plastic. An elongate, narrow-bodied fish, the male grows to about three inches in length with the female being about one half inch shorter. The general color of this killie is light yellow, and it appears to be sprinkled with gold. A golden patch on the "ear" portion of the operculum gives the fish its common name. The male F. chrysotus has somewhat larger fins than the female and they are tinted a delicate raspberry color. The slimmer-bodies female has a fleshy base to her anal fins often referred to as an egg basket.

By the time I decided my golden-ears should be old enough to spawn I discovered that all four survivors (one had jumped and another died of unknown causes) were ladies. I was able to obtain a trio of adult F. chrysotus t the 1987 spring auction of the Chautauqua County Aquarium Society and an adult pair of Fundulus punctatum at the auction of the Southtown Fish Fanciers.

Unlike the mild mannered chrysotus, punctatum would not make a good community fish, tending to be a bit of a scrapper. The fish is slightly larger than its cousin, and is the same general shape, but with a heftier girth. A band of stipples, generally centered along the lateral line on both sexes, presumably account for the species name. The caudal peduncle and tail of the male are a brilliant yellow. The intensity of the yellow always seemed to increase or decrease in an inverse ratio with the intensity of the stipple line.

I installed a divider in a 10 gallon tank and placed the F. punctatum on one side. The F. chrysotus were moved from a three gallon tank containing water at about 80 degrees F. where they were not being too productive, to the other side of the 10. This tank had water of about 72 degrees F. and was equipped with a home-made sponge filter on the chrysotus side only. The tank had no direct lighting and the water level was kept at about the 2/3 mark to discourage jumping. Just to be sure, a piece of plexiglass was used as a cover.

Soon after mops were placed on both sides, the egg laying began. Both species produce large eggs with the chrysotus eggs being slightly larger, more sticky, more irregular in shape, and less transparent when compared with the punctatum eggs. The mops were picked every other day and eggs placed in a shallow dish of water to hatch. No fungicides or special precautions regarding light were taken. Most eggs hatched after about 12 days at 72 degrees F. and the young, moved to plastic shoe-trays, eagerly gobbled up newly hatched brine shrimp. At about 1/2 inch I moved the fry to separate 10 gallon tanks containing a few small Corydorus spp cat (the only tanks then available in my then crowded fish room). Because of the cannibalism of F. punctatum, I had to sort out the faster growers which were moved to a 20 gallon tank with some Odessa barb fry of about the same size. All the punctatum fry transferred in this manner thrived, but due to the cannibalism of the younger, I ended up with less than 10% of the number hatched.

Both these fish have been added to my native fish BAP category credits and the last of them were gone as of ARVAS's 1987 "Columbus Day Auction". Killifish of the genus Fundulus are probably the most commonly spawned natives, and although they do require a little bit of special care, are certainly worth the effort.

SOME LIKE IT HOT!
Spawning Dwarf Hoplos
by Ginny Eckstein, L.I.A.S.

December of '83 found me fish shopping, not looking for anything in particular, just looking. A shipment of Corydoras elegans had come in. I kneeled on the cement floor perusing several hundred corys. Previously I've discovered some very interesting cats (C. nanus, C. pygmaeus) mixed in these shipments. Suddenly, I saw some very thin emaciated catfish that looked like some type of Hoplos. They were on death's door. I ran for a net and a container. Now, I couldn't find them. I sat on the wet floor (a bottom tank, naturally) and wondered if I had imagined them. Patience, I consoled myself. Eventually I found 11 scrawny specimens. It was bitter cold outside; I was in New Jersey and I was going to Connecticut before returning home. I prayed that my purchase would make it. Some 14 hours later, I placed the fish in a tank; they were lethargic. I increased the temperature to 84o. In my experience, raising the temperature will increase the fish's metabolism and make starving specimens more inclined to eat. I finely chopped up tubifex worms, a trick I learned from Rosario La Corte. Some of the cats started to eat, and by the end of the week, I had 6 survivors. I slowly dropped the temperature to what I've found Callichthyidae (Corydoras, Brachis, Dianema, Hoplos, Callichthys) appreciate. Although they finally accepted typical aquarium fare (flakes and

sinking pellets), their dietary choice was chopped tubifex. I had spoiled them. When I looked back at the specimens I had preserved, there was little similarity between these robust aquarium residents and their formalin counterparts. They were now 1.5" long and full bodied. They had a beautiful marbled body pattern and the most extraordinarily long barbels imaginable! I selected two and placed them in a 5 gallon tank, bare except for a sponge filter. I threw in a clear plastic lid that floated on the surface, just in case either fish wanted to experiment in bubble nest building. I prefer the clear lids, as opposed to pieces of styrofoam for bubble nest builders, because you can see the eggs and watch their development. As I retired that evening, my last thought was that I forgot my high tanks were at least 6o warmer than my sink level tanks. I hoped that there were no adverse effects on the hoplos. Less than 12 hours later I looked in their tank and saw a frantic male attempting to keep the lid away from the bubbles of the sponge filter. I was amazed to discover a feeble bubble nest, 12-15 scattered bubbles, with about 50 adhesive eggs adhering to the lid. The female was resting atop the sponge filter. With Hoplosternum thoracatum, the females get a little torn up during spawning and must be removed from the tank. This species was in perfect condition. Wanting the spawn, I took a small plastic container (comparable to a margarine tub) and scooped the plastic lid out of the tank. Two days went by and I saw no viability to the eggs. Were the eggs unfertilized? If so, why had the male been vigorously guarded them? Day 3 showed the "eyeing up" of the developing embryos. On day 5 the tiny slivers hatched out. A few eggs had fallen from the nest with no ill effect; they hatched also. The squirming fry were incredibly tiny, comparable, if not smaller, than Betta splendens'.

A few days later I noticed increased mobility, much scurrying and darting, but not what I could actually consider free swimming. I knew that their first foods must be very small; I decided to add green water and liquifry to their tank. Subsequent experience showed me that it is 7-10 days before the fry can accept microworms and newly hatched brine shrimp. It is during this period that the losses re greatest, probably from starvation. After that, they require the same care as any other fry. When they are only .25" long they exhibit the same marbled pattern and long barbels of their parents. Two weeks after the first spawn, the pair bred again. There appear to be little sexual dimorphism in quiescent specimens. Prior to spawning, the male develops light blue blush on his body, the female, a cherry red abdominal blush. They can be sexed like corys, viewed from above; the females are chunkier than the males. In H. thoracatum, mature males are easily identifiable by the thickened first ray of their pectoral fins, which turn red. The dwarf species does not exhibit this pronounced dimorphic characteristic, so familiar in the other species. Since I had been able to induce spawning with this pair by increasing the temperature, I chose another pair and tired it with them. Noting

the male seems to get upset if the lid (spawning site) floats over the bubbles of the sponge filter, I took a needle and punctured a hole in the rim. I knotted a length of string through it and secured it to the tank cover away from the aeration. The next day I was rewarded with another spawn. This was almost too easy: Increase the temperature and they spawn. To see it if was the increase in temperature or if, indeed, any temperature change would trigger spawning, I reversed the setup. This was not successful. after I had several groups of fry going, I decided not to take the next spawn and leave it with the parents. The male guarded the nest and although there was no post-hatching parental care, neither parent bothered the tiny fry. Incidentally, on each successive spawn, the male's bubble nest technique improved. To conclude, this dwarf hoplo species has proved easy to spawn and I have distributed fry to competent aquarists in this area.

MORE COMPUSERVE DOWNLOADS

The following articles were all downloaded from CompuServe's Fishnet. They were retrieved from Fishnet's Libraries. I searched on the keyword "food" and got several articles. These are the ones I could fit in here.

EXPERIMENTS WITH GUPPY FOOD by Dr. E.C. Larr & Associates in Flare, 1975. Condensed from IFGA Bulletin

The following statistics are the results of an extensive series of tests run by Drs. Larr, Johns, and Robbins, to determine which kinds of foods would cause female guppies to drop the largest numbers of fry.

Each test group consisted of three pairs of adult guppies which were fed only one kind of food - and no other - during the 120 day test period. Each tank of test fish were fed three times a day, morning, noon, and afternoon (4PM). The dry food tests consisted of alternate feedings of regular and flake food, the regular food being a 50/50 mix of leading brands of dry food, the flake food being a 50/50 mix of two leading brands of flake food. (Since this test was conducted, another brand of dry food has been tested which fits between numbers five and six for production of young).

FOOD TEST NUMBER 642 (LARR, JOHNS, & ROBBINS)

FOOD	TOTAL YOUNG	MALES	FEMALES
1. Earthworm, chopped	178	87	91
2. Earthworm, chopped frozen	164	81	83
3. Beefheart	143	64	79
4. Tubifex	141	61	80

5. Brine Shrimp, hatched	101	48	53
6. Gordon's formula (liver)	79	39	40
7. Brine Shrimp, adult frozen	76	37	39
8. Dry food, flake & regular	52	24	28
9. Freeze Dried Br. Shrimp & Tubifex	40	23	17
10. Leaf Lettuce	37	21	16
11. Peas	28	19	9
12. Farina	18	9	9
13. White worms	16	7	9
14. Oatmeal	12	5	7
15. Bran	9	5	4
16. Bread	6	5	1

In a following food test:

17.Earthworm & Dry Food	194	93	101
18.Earthworm, Beefheart & Lettuce	221	107	114

In the testing of beef heart it was found that feeding this material, even every other day, prolonged the guppies' lives from 25-50%. All low producing pairs were given earthworm at the end of the above test and all quickly gave results as in #1.

ADDITIONAL EXPERIMENTS ON FOODS

The following two foods were tested as to female productivity and rate of growth, by myself and two research men - with no communication between researchers. At the end of the tests I examined all the data sent to me along with my own - the results were truly amazing.

The females gave birth rates above 275 and throughout the six strains tested on the two mixtures all showed much faster growth rates. Comparing the two mixtures to decide which was the better would be difficult as all the test numbers were within 4.7%. From the tests, covering 1253 fish, it was not revealed which was better, but certainly both were better than any other fish food I have tested, All fish were fed three times a day, morning, noon and evening.

FOOD MIX #1

- 1 cup trimmed beef heart (trimmed of all fat and sinew, cut into cubes, and packed into a cup for measuring)
- 1 cup worms (night crawlers - chilled to keep them in the cup for measuring)
- 1 cup water (room temperature, not hot)
- 1 tbsp unflavored gelatin dissolved in 1/2 cup cool water

Put the first three items in a blender for about two minutes. Add gelatin mix, blend for another minute and strain through a fine sieve. Refrigerate until firm. Once gelled, this food can be cut into the desired size for feeding directly into the aquarium.

FOOD MIX #2

- 1 cup trimmed beef heart (made up as above)
- 1/2 cup water
- 1/4 cup Golden State Guppy Food
- 1 tbsp unflavored gelatin dissolved in 1/2 cup water

Blend as in Mix #1, gel and cut for feeding (as described above).

Sometimes the mixtures will sink, sometimes they float - probably due to the amount of trapped air in the mixture. I like mine to float, so the fish can take it near the surface.

To study what the addition of gelatin to the aquarium might do, I asked my researchers to run bacterial counts as the feeding progressed. There was no increase in bacteria numbers or type throughout the test. I further tested by adding one envelope of gelatin to a five gallon tank every ten days for one month. There was an increase of bacteria during the first four days after each addition, but this was quickly removed by one-celled animals. These one-celled animals (Euglena, Amoeba, Paramecium and several other protozoans) are excellent food for guppies and were quickly reduced in number. While I would not suggest the adding of gelatin to the water to promote protozoan growth, I can conclude that the amount of gelatin which is not eaten by the fish from the above mixtures will cause no problems of any kind.

FEEDING BETTAS
By Steve Saunders

One of the first things that betta-neophytes discover is that bettas are finicky eaters. They do not readily accept dry food, especially when housed in jars. Not that dry food is bad for bettas. Its high in protein and some of the other nutrients that bettas need for growth. For example, the legendary IBC Champion of Champions of the 70s, Chuck Hale use to swear by including dry food as part of his bettas diet. But the problem is to convince them to eat dry food. The trick it seems is to regularly feed bettas dry food from a very young age regularly throughout their lives; then, when they get older they will accept dry food even in jars.

It takes the aquarist a little longer to appreciate the relationship between the food one feeds to the betta and the rate at which the water in the betta jar fouls. The feeding of paste food is especially questionable. While jarred bettas greedily accept liver and fish paste food in both aquariums and jars, the paste does fall apart in the water. The small bits are never eaten by the fish, but are consumed by bacteria, polluting the water. Of course bettas grow better in clean water. This concept hold true with many fish species, especially those housed in small aquaria or jars.

Frozen foods from the pet store are ideal in terms of palatability to the betta, having low pollution potential and convenience to the aquarist. Some aquarists do very well feeding their bettas nothing but frozen brine shrimp. Brine shrimp appears to be ideal nutritionally-wise as the fish grow very fast given a diet of it. Another excellent frozen food is blood worms. These are aquatic larvae of a fly (midge). The fish do well on this food. Its even more expensive than frozen brine shrimp, but it seems to have less water and more "meat" per pound. On the other hand, my bettas will never accept frozen tubifex worms. Another excellent food recommended by experienced and successful betta hobbyists is shavings of frozen beef heart. Be sure to cut the shavings into small enough pieces for the betta to swallow.

Of course live foods are tops, when available. Their chief disadvantage is that the are not always convenient to the aquarist. Live foods from the store can be expensive. Among the best for the betta is the "black worm". These are not as filthy as the "tubifex" worm that aquarists use to feed to their fish extensively and bettas seem to prefer black worms to tubifex worms when given a choice. Live adult brine shrimp can be obtained from some stores. Its an excellent food (the Californian bettaphiles used to collect and feed it to their fish with fantastic results) but hard on the pocket book.

Collectable live foods from this area include mosquito larvae, fairy shrimp, blood worms, glass worms and daphnia. These are certainly the best foods for bettas. But all these foods are available only seasonally and cannot be relied upon year around. Of the cultured live foods, white worms are the most practical, but must be fed sparingly because they cause constipation and fat build-up if fed too frequently.

FISH NEED VITAMINS TOO!
pt15:lm4:rm75:cn0:ln2:ls8:ju1:pp80:pg72

In our diet conscious society we are all aware that there are certain nutrients that we need in small amounts, and only in small amounts, independent of our energy intake. We call these

nutrients vitamins; even though we may not require a lot of any one vitamin, but we do require some of it for our health and well-being (also known as "metabolism" to biologists).

Likewise, our fish require vitamins too. Not much is known of their requirements. Only cultivated fish of great commercial importance have been studied. This means most of our knowledge on fish nutrition is based upon studies of economically important-commercially raised species such as trout, salmon and channel catfish. It is possible to use this information to make intelligent guesses as to the vitamin dietary requirements of our aquarium fish, but it is still only a guess.

Aquarists tend to use vitamins as supplements to fish food. These are usually added in the form of "liquid baby vitamins (available in a drug store over the counter, dog or cat vitamins) available at some petshops or from pharmaceutical or chemical supply houses. One vitamin that is frequently used by aquarists as a bat h solution is vitamin B12 as it is thought to accelerate the rate of fin mending .

This article focuses on the importance of vitamins to our fish. Please do not interpret the vitamin requirement of your fish out of proportion. Many other nutrients are just as important to the well being of our fish.

FAT SOLUBLE VITAMINS

VITAMIN A - RENTINOL

In humans vitamin A has primary roles in vision, maintenance of skin, bone grow the and reproduction. Vitamin A deficiencies result in partial or complete blindness. Generally the biochemical pathways of Vitamin A are poorly understood.

Excessive consumption of vitamin A by humans can lead to bone and skin problems , as well as endangering fetuses of pregnant women. Caution, then, should also b e taken in adding vitamin A to fishes' diets

Vitamin A is present in both animal and vegetable foods, most abundant in liver (all kinds), kidney, eggs and milk. Carotene (especially alpha and beta carotene and cryptoxanthin) the pigment that gives carrots (and some fish) their bright orange-red color is a precursor of vitamin A. Thus, foods such as spinach and carrots are important sources of this vitamin. Vitamin A is found in relatively high concentrations in fish oil - indicating both a good source of vitamin A and the need of fish for it.

Quantities of vitamin A are usually expressed as international units, IU, a defined level of vitamin A activity.

Channel catfish are thought to need 5500 IU of vitamin A per Kg of food in their diet, trout and salmon are thought to need 4000 IU per Kg. Trout at least, can suffer from too much vitamin A.

VITAMIN D - CHOLECALCIFEROL AND ERGOCALCIFEROL

This is the vitamin that humans can synthesize if they are exposed to sunlight. Being Canadians we don't get enough sunlight, so we must acquire it from other sources - marine oils and fish tissues - yes Cod Liver Oil is a good source of vitamin D. Apparently fish can produce at least some of their quota of vitamin D f rom sunlight exposure just like humans.

Vitamin D is found in earthworms, tubifex and other oligochaete worms. Perhaps this is the reason why fish fed these worms are more prolific and grow quickly.

Vitamin D is involved in the regulation of calcium metabolism. Calcium is important in many of the biochemical reactions in our bodies and is the major component in the bones of fishes and humans alike.

Vitamin D comes in at least 3 forms ... D1, D2 and D3 strangely enough. D1 and D2 are the most readily available and is used by most animals including you and me. However some animals require the D3 form ... D1 and D2 is close to useless t o poultry and lizards who's health depends on vitamin D3. Its not clear to me if our fish require D3 rather than D1 and D2 but the best source of D3 is fish oil s ... cod liver oil for example.

Deficiencies or excesses of vitamin D results in problems with calcium metabolism. Historically, rickets results from vitamin D deficiencies.

The channel catfish is thought to require 500 IU of vitamin D per Kg of its food diet.

VITAMIN E - TOCOPHEROLS & TOCOTRIENOLS

This vitamin acts as an antioxidant for polyunsaturated fatty acids in humans.. .protecting the fatty acids from untimely breakdown. (Fatty acids are important to fats and oils in animals which store energy for later use). Since fish tissue is high in unsaturated fatty acids, this vitamin probably plays a major role in fish metabolism.

Vitamin E is abundant in many vegetable oils, particularly rapeseed oil, which is used wildly in Canadian food products containing oil.

Vitamin E is thought to be needed in the diet of channel catfish - 50 mg per Kg of food and trout and salmon - 400 mg per Kg of food.

VITAMIN K - VARIOUS QUINONES

Vitamin K is required for clotting blood and acts as a co-factor in other biochemical reactions. Deficiencies in the vitamin results in disorders in these reactions.

Generally leafy green plants eg. spinach are good sources of vitamin K. However , in humans and probably our fishes, much of our vitamin K is derived from the bacteria that live in our intestines. They synthesize vitamin K and we absorb it from them.

Channel catfish are thought to need 10 mg of vitamin K per Kg of their food, trout and salmon are thought to need 40 mg per Kg.

WATER SOLUBLE VITAMINS

VITAMIN C - ASCORBIC ACID

This is the vitamin that food manufactures add to orange juice and just about a ny fruit or vegetable product and even some meats to act as an antioxidant. It prevents chemical spoilage-browning reactions in fruits and vegetables etc.

Despite our requirement for this vitamin, scientist still have not figured out all the reasons why we need it. It takes part in so many reactions! One of our primary sources of vitamin C is citrus fruits - oranges, lemons etc. One disease caused by a deficiency of vitamin C played an important role in world and Canada 's exploration, scurvy.
Overdosing on vitamin C does not lead to immediate visible problems in humans, but caution with all vitamins including vitamin C is important.

In fish vitamin C is involved in the development of bone matrix, blood vessels and wound repairs. Apparently, vitamin C also helps pond raised fish resist the effects of certain insecticides that may pollute their waters. Considering what enters our water supply via the Niagara River, there's no doubt our fish can benefit from vitamin C too.

In Channel Catfish, 50 mg per Kg of diet is thought to be needed; in trout and salmon 100 mg per Kg. Deficiency of vitamin C is known to cause the "broken back syndrome" in commercially raised channel catfish; a curvature of the spinal column that results in unsightly deformed looking fish. This seems to occur primarily in heavily stocked ponds. Lower stocked ponds do not seem to depend as greatly on vitamin C.

Vitamin C is thought to be the most sensitive vitamin to deterioration during storage of dried fish foods. In a warm fishroom, half of the vitamin C in a pelleted fish food will disappear in three months. And heaven only knows how long the food had been stored in wholesale/retail operations before you bought it!

VITAMIN B1 - THIAMIN

Thiamin acts as a co-enzyme in many biochemical reactions that are important to the metabolism and well-being of ourselves and of fish. In humans and in fish, thiamin may be important in usefully employing dietary food energy especially carbohydrate metabolism.

Channel catfish are thought to need 20 mg of thiamin per Kg of food; salmon and trout 10 mg per Kg.

"VITAMIN B2" - NIACIN

Niacin or nicotinic acid is a essential B vitamin, playing a major role in the biochemical conversion of food into energy.

Niacin is thought to be needed in concentrations of 100mg per Kg of channel cat fish diet and 150mg per Kg of salmon and trout diet.

VITAMIN B2 - RIBOFLAVIN

Riboflavin is a nutritional factor for all species, playing important roles in various stages of energy metabolism.

Riboflavin is thought to be needed at concentrations of 20mg per Kg of channel catfish diet and 40mg per Kg of salmon and trout diet.

VITAMIN B6 - PYRIDOXAL PHOSPHATE

Pyridoxine phosphate is needed for various biochemical reactions in the cell for the utilization of energy and the synthesis of chemicals needed for life. Pyridoxine is thought to be required in concentrations of 20mg per Kg of channel cat fish diet and 10mg per Kg of salmon and trout diet.

VITAMIN B12 - CYANOCOBALAMIN

This is a complex vitamin of great interest to aquarists. It is a growth factor in most animals and in fish is thought to help increase the rate of healing of split and damaged fins. Fish have been treated with vitamin B12 by addition of t he vitamin to the water, or to the diet or through injections. The last method seems to work the best, but is usually too tricky for the home aquarist to apply and is only practical with large expensive fish. . There seems to be a limit to its usefulness ... if the fins are too badly damaged nothing helps.

Apparently some manufacturers believe in B 12 too; Aquarium Pharmaceuticals included Vitamin B 12 in their betta medication called "Bettamax".

Vitamin B 12 is thought to be a requirement of channel catfish diet, in small amounts, in salmon and trout 0.02mg per Kg of food has been reported as a requirement.

OTHER VITAMINS

Finally here is a list of the less well known enzymes and there reported effects:

Vitamin B6 - an essential enzyme in fish that takes part in protein metabolism. Salmon and trout are thought to need 10mg per Kg of diet, channel catfish are thought to need 20mg per Kg.

Biotin - deficiency of biotin results in the "blue slime disease in salmon and trout. These fish are thought to need 1mg of biotin per Kg of diet.

Insitol - essential to salmon and trout, according to some sources, and not required according to others, Involved in oxygen transport / respiration.

CONSIDERATIONS

It is important that we meet our fishes' the dietary requirement for vitamins. The best source is in live foods. Many fish can pick up vitamins simply by grazing on algae ... if that is their habit. Some vitamins can be given through feeding our fish fresh foods - fresh beef liver or heart is a good source. Freezing or drying foods can destroy the biological activity of vitamins. In frozen and dry foods the biological activity of vitamins decrease with storage time. Hence if you are making your own paste or dry food, it is wise to supplement this food with added vitamins. These vitamins can be had from baby vitamins, pet vitamin supplements, etc. or by insuring that high vitamin foods such as spinach, egg yolks, cheeses, liver, carrots and wheat germ make

up a major portion of the prepared food. By feeding your fish well, you can enjoy them at their best!

REFERENCES

Health and Welfare Canada (1983) Recommended Nutrient Intakes for Canadians. Ca OE. (1970) Textbook of Fish Diseases. T.F.H. Publications, Jersey Cit y, new Jersey.

Brown, E. E. and Gratzek, J. B. (1980) Fish Farming Handbook. AVI Publishing Co . Westport, Conn.

Brody, J. (1965) Fishery By-Products Technology. AVI Publishing Co. Westport, Conn.

Masters, C. O., (1975) Encyclopedia of Live Foods. T.F.H. Publications, Jersey City, New Jersey.

Sterba, G. (1983) The Aquarium Encyclopedia. The MIT Press. Cambridge, Mass.

REPRINTED FROM THE WILLOWDALE AQUARIUM SOCIETY'S PUBLICATION "FISH FINATICS - DECEMBER 1985".

TRADING POST

Club member wishes to buy several 100 gallon and up tanks: Filtration, lights, etc. included. Home-made tanks considered-no tank too large.

Write: Steven Hutchins
Box 65020
Washington Square Station
Washington, D.C. 20036

BOWL SHOW REPORT FOR

MAY

CICHLIDS

New World Mouthbrooders

No Entries

Pseudotropens

No Entries

Open

No Entries

EGGLAYERS/LIVEBEARERS

Goldfish/Koi

No Entries

Characins

1st Barrie & Raymond Farmer- Cardinal Tetra

Open

1st Tony Fitz - A. cognatum (bandundu)
2nd Tony Fitz - A. exig

Totals through May 1988

	Month	Quarter	Annual
K. Muller	-	-	1
R&B Farmer	6	6	7
G. White	10	10	33
R. Hammond	6	6	6

	Month	Quarter	Annual
T. Fitz	12	31	67
R. Hughes	-	-	9
K. Muller	-	-	5
R&B Farmer	6	6	18
T. Williams	-	-	1
J. Stieringer	-	-	11
T. Hetzel	-	-	5
J. Mangan	3	3	16
R. Hammond	2	2	2
L. Spickler	4	4	4

June Classes: Egg/Live: Anabantoids, Corydoras Catfish, Open
Cichlids: New World Large, Riftlake (No Pseudo), Open

July Classes: Egg/Live: Guppies, Barbs, Open
Cichlids: New World Medium, Haplochromis, Open

MARYLAND

ANIMAL EXCHANGE
765-A Rockville Pike
Rockville, Maryland 20852
424-PETS

AQUARIUM CENTER
Randallstown Plaza Center
Liberty Road at Offutt Road
(301) 521-4529

FISH FACTORY AQUARIUM
582 North Frederick Avenue
Gaithersburg, Maryland 20877
(301) 977-7500

GAITHERSBURG PET CENTER
642 Quince Orchard Road
Gaithersburg, Maryland 20878
(301) 948-1133

GLENMONT TROPICALS
Glenmont Shopping Center
12345 Georgia Avenue
Wheaton, Maryland
949-0344

PETLAND
White Flint Plaza
5268 Nicholson Lane
Kensington, Maryland 20895
(301) 231-5216

RICK'S FISH & PET SUPPLY
36 South Market Street
Frederick, Maryland
(301) 694-9664 831--6868

PET MART ROCKVILLE
2230 Veirs Mill Road
Rockville, Maryland
762-3505

SHOWCASE AQUARIUM
11248 11250 Triangle Lane
Wheaton, Maryland 20902
942-6464

TROPICAL LAGOON
9439 Georgia Avenue
Silver Spring, Maryland
585-6562

CONGRESSIONAL AQUARIUM
Congressional Plaza
152 Congressional Lane
Rockville, Maryland 20852
881-6182

MONTGOMERY TROPICALS
7845-G Airpark Road
Gaithersburg, Maryland 20879
(301) 670-0886

SUPPORT YOUR LOCAL PET SHOP -- THEY HELP SUPPORT US

PVAS' March 2, 1988 Board Meeting

The board met at 7:45 pm at Show Chairman Pete Thrift's home. Gene Aldridge presided; also attending were Kenny Warren, John Stieringer, Bob Pallansch, John Mangan, and Gerry Hoffman. Pete Thrift announced that the appointments of Show judges Gerry Pottern, Dave Shaw, and Gene Aldridge are firm; Paul Loiselle, Bill Cunningham, and Chuck Davis' are still tentative. He is confident that most of the weekend's chores will be well staffed but is concerned about auctioneers, fish sitters, and concessionaires. The Board discussed revision of 3/$1.00 raffle procedures: to allow winners to be out of the room when numbers are called.

Kenny Warren reported that trophies, placques, and ribbons are on hand; other supplies (markers, labels, airline tubing, air stones, etc.) are available.

John Mangan was asked to look for unusual fishes to purchase for the auction.

Gerry Hoffman reminded us that our funds are quite low, but with care we can squeak through 'till after the auction.

Other show items:
De-chlor and possibly black worms will be sold at the auction.
The Washington Post ad will run twice; the Sunday and Saturday previous to the auction.

Gene Aldridge announced that:
Barry Farmer has agreed to be bowl show secretary.
Application has been made to reserve the Wood Center for our '89 meetings.
Lee Splickler will chair the nominating committee; they will begin early this time to consider next year's candidates for office.

The meeting adjourned at 9:15.

Respectfully submitted,

Robert J. Pallansch
Recording secretary

1988 SPRING SHOW RESULTS

BEST IN SHOW - Pete Thrift — Symphysodon aequifasciata

RESERVE IN SHOW - Richard Powell — Aequidens rivulatus

TOTAL NUMBER OF ENTRIES: 249 (Includes IX, X)

TOTAL NUMBER OF ENTRANTS: 36

TOTAL PVAS ENTRANTS: 24

NOTE: Number in parentheses is total entries for sub-class

I. Livebearers	First	Second	Third
a. Guppies (9)	Rockwells	Rockwells	Brinkac
b. Mollies (1)	Pallansch		
c. Swordtails & Platies (13)	Mangan	Mangan	Chow
d. Goodeids (8)	Mangan	Mangan	Mangan
e. AOV Livebearers (5)	Mangan	Rockwells	Mangan

BEST OF CLASS - LIVEBEARER: Mangan (Characodon aurax)

II. Egglayers (Non-Cichlid)			
a. Catfish, Corydoras (12)	Pallansch	Wilkie	Rockwells
b. Catfish, African (10)	Hammond	Stieringer	Farmers
c. AOV Catfish (17)	Hammond	Farmers	Farmers
d. Betta Splendens (10)	Duley	Hammond	Manwaring
			Pallansch
e. AOV Bettas & Anabantoids (8)	Rockwells	Rockwells	Duley
f. Sharks & Loaches (8)	Trzonkowski	Lundgren	Lundgren
g. Characoids, Under 3" (7)	Williams	Rockwells	Mangan
h. Characoids, Over 3" (6)	Hoffman	Hammond	Chow
i. Barbs (6)	Pallansch	Bailey's Pet	Bell
j. Goldfish & Koi (2)	Bennett	Bailey's Pet	
k. Danio, Brachydanio, Rasboras (5)	Bell	Bell	O'Bannon
l. Killifish (19)	Williams	Stieringer	Hetzel
m. North American Native Fish (5)	Pitts	Pitts	Hammond
n. AOV Non-Cichlid Egglayers (16)	Stieringer	Stieringer	Manwaring

BEST OF CLASS - NON-CICHLID EGGLAYER: Stieringer (Badis badis)

III. Cichlids	First	Second	Third
a. New World Large (3)	Powell	Perez	Bailey's
b. New World Med (6)	Kooken	Bailey's	Bennett
c. New World Dwarf (4)	Williams	Pitts	Hoffman
d. Angelfish (10)	Bennett	Bennett	Bennett
e. Rift Lake, Malawi (3)	White	Pitts	White
f. Rift Lake, All Other (6)	Pitts	Cohen	Cohen
g. Discus (5)	Thrift	McKay/Bell	McKay
h. Non-Rift Lake African (7)	Pitts	White	McKay
i. Cichlid Pairs (11)	Bennett	Bennett	Bennett
j. AOV Cichlids (2)	Pitts	Pitts	

BEST OF CLASS - CICHLID: Thrift (Symphysodon aequifasciata)

IV. Marine

a. Fish (4)	Bell	Pisconte	Eaton
b. Invertebrates (0)			

BEST OF CLASS - MARINE: Bell (Moray Eel)

V. Family of Fishes (5)	Rockwells	Perez/Bennett	Bennett
VI. Plants (4)	Hoffman	O'Bannon	Kendall
VII. Set Tanks (3)	Bailey's Pet	Kooken	Powell
VIII. Dealer Tanks (1)	Bailey's Pet Center		

IX. Photography

a. Photographic Slides (2)	Pitts	Pitts	
b. Photographic Prints (1)	Bailey's Pet		
X. Arts and Crafts (3)	Hurst	Hughes	Rockwell

Many thanks to all those who worked so hard to make the 1988 Show the success that it was. Friday set-up went especially smoothly, club members manned the entry registration tables with no gaps in coverage, we had "fish sitters" both Friday and Saturday nights without having to draft anyone, and Sunday teardown went as smoothly as set-up. The show drew considerable public traffic and very positive comment, and we gathered more than a few new members as a result.

Thanks to the judges. Theirs is a thankless job that takes hours of concentrated effort to do well. Our judges did theirs very well.

Many thanks also to those club members who entered this year's show. The total number of entries was up by 26%, and the number of PVAS participants was up by 60%! These increases have reversed the decline in the participation in our shows for the past several years. The entries were all of high quality, and competition in several categories was very close - in some cases, the difference between first and second was one point or less out of a possible 100 points!

Pete

BREEDER'S AWARD PROGRAM
STATUS

Grand Master Breeder

John Jessup	595(Provisional)

Master Breeder

Garland Neese	1,115
Gerry Hoffman	895
Pat & Maggi Mahoney	785
Darrell Holman	640
Woody Griffin	610

Advanced Breeder

Ruth Brewer	305

Intermediate Breeder

Roser Family	260
Alex Cummins	205

Breeder

Frank Angilletta	140
Nathan Mainwaring	100
Kenny Warren	90
Gene Aldridge	80
George White	60
John Mangan	50
Sharon Steele	50
Amy Stirman	50

Members Working For BAP Status

**Kenneth Muller	270(Provisional)
Howard Kresin	15
Pat Gore	10
Jason Hoffman	10
Ray Krause	10
Leslie Stirman	10

Reported Spawnings

Kenneth Muller	Transfered Records
Jason Hoffman	Livebearer
Sharon Steele	African Mouthbrooder
John Jessup	Crawfish

BAP BOARD MEMBERS

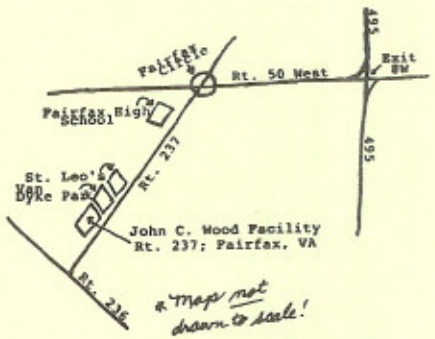
John Jessup (Chair) (Oakton) 255-7238
Gerry Hoffman (Warrenton) 347-7486
John Mangan (Vienna) 938-4778
Alex Cummins (Prince Georges) 656-6355
Gene Aldridge (ex-officio) (Arlington) 998-8757

CHECKERS

Arlington County:	Pat Gore - 522-3884
Fairfax-Vienna:	Jim Long - 280-1753
Alexandria:	Jerry or Amy Stirman - 941-6729
Clifton-Centerville:	Kenny Warren - 378-8838
Dale City-Stafford:	Bob Roser - 659-1879
Warrenton:	Gerry Hoffman - 347-7486
Prince Georges County:	Alex Cummins - 656-6355
Montgomery County:	Ray Hughes - 424-3531

N.B. If you cannot reach your nearest checker, please call you nearest BAP Committee Member or John Jessup at 255-7238. An arrangement will be made to get someone to check your fish.

POTOMAC VALLEY AQUARIUM SOCIETY
P.O. BOX 6219
SHIRLINGTON STATION
ARLINGTON, VA 22206



The Potomac Valley Aquarium Society will meet on the following dates in 1988:

11 Jan	9 May	12 Sep
8 Feb	13 Jun	17 Oct
14 Mar	11 Jul	14 Nov
11 Apr	8 Aug	12 Dec

Meetings are held at the John C. Wood Facility, Route 237 (Old Lee Highway), Fairfax City, VA. Doors open at 7:30, meetings start at 8:00. EVERYONE IS WELCOME!!!!!!!!!