

Article Id
AL04109

GEL FEED: AN INNOVATIVE APPROACH FOR ORNAMENTAL FISH

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Gel feed is a viscoelastic substance and many gelled feed products are manufactured around the world. A gel feed is a form of substance intermediate between solid and liquid as well as exhibits mechanical rigidity. Gels are a form of colloid composed of a firm three-dimensional structure enclosing a liquid phase. Gels are produced when a substance changes from a gel (solid) to a sol (liquid). These polymers consist of molecules that are intertwined and interconnected by molecular network cross-links.

Ornamental fish farming is an ancient practice. Colorful and peculiar fish are commonly called "ornamental fishes". These fish kept in the aquarium are used to decorate the house. Recently, they have occupied an important position in commercial trade, especially in earning foreign exchange. In India, *Botia dario*, *Botia rostrata*, *Colissa fasciata*, *Trichogaster labiosa*, and various species of *Nemacheilus botia* and *Schistura papulifera* are considered colorful ornamental fish. The Indian ornamental fish trade is dominated by freshwater fish (90%), of which 98 percent are raised and 2 percent are caught in rivers, lakes, and ponds. The remaining 10% are marine fish of which 98% are caught and 2% are reared. Most ornamental fish breeders in India breed exotic fish and very few breeds of native, marine, and saltwater fish. Goldfish are the most popular among hobbyists, and as a result, goldfish breeding dominates the Indian ornamental fish business.

Indigenous Freshwater Ornamental Fishes

Some of the indigenous freshwater ornamental fishes are as follows. Such as *Botia lohachata*, *Brachydanio rerio*, *Chanda nama*, *Trichogaster chuna*, *Labeo nandina*, *puntius conchonius*, *Puntius sophore*, *Colisa lalia*, *Oreochthys cosuatis*, *Labeo calbasu*, *Puntius arulius*,

Dawkinsia filamentosa, Macrognathus aral, Nandus nandus, Notopterus notopterus, Horabagrus brachysoma, Mystus vittatus, Botia dario, and Botia rostrata, etc.

Commercially Important Ornamental Fishes

Some of the commercially important freshwater ornamental fishes are as follows. Such as Goldfish, Koi carp, Guppies, Molly, Swordtail, Platy, Barbs, Gourami, Oscar, Bala Shark/Silver Shark, Siamese Fighting Fish, Firemouth Cichlid, Kissing Gourami, Red-tailed Black Shark, Cardinal Tetra, Neon Tetra, Angelfish, Rasbora, Harlequin Fish, Asian Arowana, Discus/Pompadour Fish, Three Spot Gourami, Zebrafish, Marble Molly and Sail Fin Molly, etc

Ingredients for Making Gel Feed

Fresh fish meat - 100 gm, salt - 2%, corn flour - 7%, gelling agent - 2.5%, vitamin-mineral premix - 0.5%, and yeast - 0.5%.

Gel Feed Preparation

The fine/powdered ingredients are thoroughly mixed to form a gel feed. All ingredients are mixed in a mixer for a short period. (i) providing a gelling agent, a source of additional fiber, and water; (ii) a mixture of gelling agent and little-fiber to form a mixture; (iii) by mixing water and a mixture to form a gel feed; (iv) take gel feed in an aluminum foil and sealed with sealing machine; (v) boiling of gel mixture at 40 C for 30 minutes and 90 C for 45 minutes; (vi) cooling the gel feed with ice to form a firm, flexible gel feed; (vii) gel transferring/ kept in deep freezer for one night. Gel feed can be frozen in one or more molds, and/or frozen as a single feed (which can then be rehydrated and used).



Fig: Gel feed

Application of Gel Feed

Gel Feed as a Drug Carrier

Fish in aquaculture sometimes require medication/other health treatment. It is known to use gel feed as a carrier of drugs or other additives on the feed according to its holding capacity. Water stable gel feed that efficiently transfers drugs or other additives to aquaculture species, resulting in maximum utilization of the additional drug or additive. Immuno-stimulants, probiotics, and other medications may also be added to the gel.

Gel feed as a Carrier of Carotenoids and Pigments

The use of a liquid carotenoids supplement present like an emulsion in a gel feed has a high bioavailability and results in changes in skin color in animals, especially fish. The performance of such emulsions can exceed that of dry formulations. Liquid carotenoids supplement already added to dry food for vacuum penetration. This allows carotenoids to enter the fat, thereby increasing bioavailability. The liquid gel continues to protect the vitamins, carotenoids, and feed against oxidation after use in the composition of the feed product.

Advantages of Gel Feed

Gel feed can be rapidly prepared and fed as a single moistened piece or compressed to form a block and the block can be cut into pieces of the size and shape that are being fed. It is suitable for ornamental fish species. Alternatively, the gel can be pressed into feeders such as corals for saltwater fish. The gel can also be pressed onto a rope or optional feeder for presentation. This is especially important when feeding fish in captivity. Gel feed can be frozen without loss of its nutritional content, and defrosted gel retains its gel structure and gel properties so that a frozen and defrosted gel is almost indistinguishable from an unfrozen gel. This gel is useful for storing the product. It is water stable for more than one day without degradations in water. High feed acceptance by the ornamental fishes such as Goldfish, *Botia dario*, *Puntius* species, and other fishes.

Conclusion

A gel feed is a form of substance intermediate between solid and liquid as well as exhibits mechanical rigidity. Gels are a form of colloid composed of a firm three-dimensional structure enclosing a liquid phase. Gel feed can be frozen without loss of its nutritional

content, and defrosted gel retains its gel structure and gel properties. The gel can also be pressed into a rope or optional feeder for presentation. This is especially important when feeding fish in captivity. Gel feed is used as a carrier of drugs, carotenoids as well as pigments in ornamental fishes.

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