

## **Head growth in Orandas Originally appearing in the Goldfish Report, 1996; modified September 2005**

Head growth, like so many characteristics in goldfish, is determined largely by genetics. If good breeding stock is selected for head growth, chances are, the offspring will inherit this characteristic from the parents. But what happens when you do not breed fish, and cannot view the parent fish? How is head growth selected-for by non-breeding enthusiasts?

One tired-and-true method of selecting potential head growth fish is to purchase those fish with blunt, rounded heads. Blunt heads offer room for potential head growth; avoid pointed or pinched heads, whenever possible. Of course, if purchasing larger, more fully developed fish, it is often possible to select specimens with more developed hoods.

There are three recognized head growth styles for Orandas: in practice, many more probably exist. The first of the three head growth types occurs primarily on the top of the head, and is generally well developed in the cranial region. These fish are often referred-to as goose heads or high heads. The second type of head growth occurs in the cranial region and in the cheeks. Some of the goldfish literature refers to these type fish as tiger heads. The final type, and to many enthusiasts, the most desired type of head growth occurs in the cranial region, cheeks, and on the gill plates themselves. In some books, these more fully developed hoods are referred to as Lionheads, although this name should probably be limited to the dorsal-less, straight back variety of hooded fish.

The actual hood itself is a series of warty, raspberry-like growths which are composed of soft flesh. The development of the hood can begin as early as two to three months of age, and will continue as long as the fish lives. It is not uncommon for the hood to partially or totally cover the eyes of mature specimens. spurts of hood growth are marked by small, white bumps appearing on the surface of the hood. Inexperienced fanciers (myself included when I first started raising fish) often think that these hood growths are a sign of disease. In fact, the presence of these white bumps on the hood, are a good indication that the fish is healthy.

In order to produce good hood growth, Orandas (Lionheads and Ranchus) require higher protein content in their feed than other goldfish. Many commercial preparations have been specifically formulated to meet the increased nutritional needs of these fish. As a general rule, 40% or more protein content is required to produce good hood growth. I've noticed that a high concentration of algae or vegetable matter in the diet also leads to enhanced hood development. Live foods are commonly recommended as supplements leading to good hood growth, and earth worms, mosquito larvae, worms, daphnia and tadpoles are good sources of live food, especially for fry. I raise my fry in outdoor ponds which generally have good concentrations of blood worms, mosquito larvae, daphnia, and filamentous algae; as a result of the presence of this live food, the head growth in these fish is very good.

As a feeding supplement, I prepare a home-made food based upon the formula which appeared in the Goldfish Guide by Matsui and Axelrod (for a discussion of the formula see the January, 1994, edition of the "Goldfish Report," or visit the article on this website). The benefit of this formula is that it can be made in the consistency of a pudding for the fry, or as a cake, for use with adults. I have also experimented with a similar formula for fry, but substituting gelatin as a binding agent, rather than oatmeal or farina.

While nutrition is an important consideration in achieving optimal head growth in Orandas, water quality is another factor which cannot be overlooked. All goldfish are susceptible to poor water conditions, and are relatively intolerant of the presence of ammonia. The use of an adequate biological filter is essential for raising these fish. Another important factor in achieving optimal water quality is the presence of dissolved oxygen. Goldfish have relatively large mass in proportion to their overall length, and require proportionately larger amounts of dissolved oxygen than a tropical fish of comparable length. The requirement for dissolved oxygen is accentuated in the head growth fish, since in fully developed specimens; the growth covers the gill plates making the function of respiration more difficult for these fish. I think that a fair number of these fish die of suffocation as they become mature – the growth on the gill plate makes breathing more difficult.

To summarize, what makes for good head growth in Orandas? The first consideration is good head growth potential – get good brood stock and look for a blunt head. Secondly, provide good nutrition with a high percentage of protein in the diet. Finally, provide optimal water

quality – which means adequate biological filtration – and plenty of oxygen in the water.