larvae are positively buoyant before becoming free-swimming – they float on the surface.

With very few exceptions, **once larvae stop hanging and become free-swimming, they are ready to feed**. *Successful recognition of this is therefore of the utmost importance*.

For the vast majority of species, the most easily observable indicator of the larvae becoming free-swimming is that they become neutrally buoyant – that is, they swim, remain motionless or drift in the water without sinking or floating to the surface. This is not always easy to see because the newly free-swimming larvae of some species stay very close to or against the sides or bottom of the tank, in corners or against other surfaces. In this case, to ascertain their state of buoyancy it is necessary to disturb them so that they move away and can be seen in the column (main body of water).

A net handle or similar instrument waved near to them will get the larvae to move; even gently bumping the tank will usually send them scattering. Some will immediately dart back to the side or corner, but usually a few will remain motionless, even if only momentarily, in the column. This is the opportunity needed – if they sink they are not free-swimming; if they hang motionless they are. This phenomenon is especially easily observable at night using a torch, at which time free-swimming larvae naturally move away from surfaces into the column and stay there.

Another helpful though less conclusive indicator for some species which do not move into open water, is that before becoming free-swimming, larvae tend to hang predominantly vertically against tank walls or from the surface, whereas after becoming free-swimming they are more inclined to position themselves at *various angles* against surfaces. Barbs typically do this.

Larvae which move completely away from surfaces out into the centre of the tank, often just below the surface, and remain there once free-swimming, are easily recognizable, particularly by the horizontal position of the body in their swimming movement. Examples of species which exhibit this behaviour include danios, rainbowfish, gouramis and Congo tetras.

Exceptions: Cichlids behave slightly differently – their larvae swarm in a shoal when they become free-swimming, a sure sign they are ready to feed even though they are not fully neutrally buoyant when this first happens. In fact they sometimes appear to have to work quite hard at lifting off the tank floor and staying in the column. At night they gather and remain in a tight cluster on the tank floor or other substrate.

Corydoras catfish are another notable exception to the rule of neutral buoyancy. Most species remain negatively buoyant all their lives and have to swim actively to move upwards or even stay at the same level. Readiness for a first feed is less easily ascertained in their case, but a clue lies in the disappearance over a few days of their initially large yolk sacs. When these have disappeared, a small amount of brine shrimp can be added to test them. An orange-coloured belly confirms feeding.

There are species which become free-swimming immediately or almost immediately after hatching, and which move into and stay in the column without a 'hanging' stage. They often, but not always, stay close to the surface. This is unmistakable in the rainbowfish and Congo tetras. (Congo tetras stay in the mid-water area rather than at the surface.) Danios also move to the surface when free-swimming, but only after hanging on the tank sides or surface for a few days. When this is observed they are all ready to feed.

The illustrations in FIGs 3.52 to 3.55 show some typical trends in egg-scatterers' larvae before and after becoming free-swimming.

Note that on occasion larvae do not develop properly after hatching, possibly as a result of poor health of broodstock, or stressful post-spawn circumstances such as poor water quality, rough handling or dense protozoan or bacterial blooms. This is evidenced by slow, often uneven development, and the failure of all or some larvae to become properly free-swimming. When this happens, some or all of the larvae may be seen 'hopping' with jerky movements, as though trying to reach the surface. If they stop swimming they sink, indicating swim bladder problems, though larvae exhibiting this behaviour also often appear to have small yolks and to be thinner than usual, sometimes with deformities in the group.

Medication will not help, and they are unlikely to survive. Even if there are survivors in such spawns they are likely to be weak, grow slowly and unevenly, and possibly be deformed in some way.