pond. (Broodstock numbers can be increased for platies and guppies if necessary.) All breeders are carefully selected for optimal characteristics of the strain. The remainder of the 20 ponds are used for growing out fry to sellable size.

Water chemistry and temperature. Although fairly adaptable, the species covered here are happier in moderately hard to hard water with an average pH of around 7.5 to 8.5. (The pH can fluctuate substantially in outdoor ponds in poorly buffered water with algal blooms, but this is generally well tolerated.) In some parts of the world, water of fairly high salinity – up to about 9 ppth – is used very successfully for livebearer culture, especially for mollies and guppies. It is considered highly desirable for their production, but this is not always an option and is not essential. In the system described here, fresh underground water is pumped continuously into all ponds at a flow rate of about 50% of the pond volume every 24 hours. This is a very high rate of exchange, and far lower exchange rates could be used, provided water quality is not compromised.

The livebearers included here are all warmth-loving, and temperatures of 27° to 30°C (81° to 86°F) are about optimum. At temperatures below about 21° or 22°C (70° or 72°F) reproduction can be expected to slow substantially or stop altogether. They can certainly tolerate higher and much lower temperatures, but while slightly higher temperatures may produce faster growth, the risk of sudden deterioration in water quality and other problems is also higher. Sustained very low temperatures will produce poor growth, and if extended and sufficiently low, will affect health.

Broodstock diet. In the tunnel environment, sunlight produces algal blooms (green water) and algal growth on the pond walls, making a valuable contribution to the breeders' diet. However, because the ponds used here are relatively small, with little natural food other than algae, breeders are fed on vitamin/mineral-enriched dry diets supplemented two to three times weekly with wet diets incorporating liquidized chicken liver.

Broodstock and breeding. The breeders are kept in production for as long as they continue to produce acceptable numbers of healthy, good quality offspring. When groups of breeders start to decline in number through natural losses, but are still producing good numbers of healthy offspring, they are removed from their pond and added to other groups of breeders of approximately the same age to increase the numbers in those groups. (Breeding ponds are never 'topped up' by adding young breeders to old when broodstock numbers decline.) The emptied breeding pond is restocked completely with new, young (but mature) selected breeders. When the older groups eventually decline in productivity, they are totally replaced with new breeders.

This routine ensures a good continuity of flow, and complete, regular renewal of breeders of top quality, without any opportunity for the strain to degenerate. Usually only one strain is produced in each tunnel, thereby reducing the chance of cross-breeding occurring by the accidental introduction of a foreign strain to the breeders. (If there is a need to grow two different strains in one tunnel, it is preferable to work with two varieties which will not interbreed – though in these circumstances there is actually very little opportunity for accidental mixing.)

As with all ornamental fish production, it is critical with livebearers to ensure that there are always sufficient back-up breeders growing out well in advance. Whenever back-up breeders are needed, the required numbers of the best quality fish are selected after harvesting, and grown out for future broodstock. Any exceptionally high quality individuals are also taken out whenever noticed during routine harvesting, sorting and counting, and kept for future use as breeders.

Care of newly born fry. To protect fry from cannibalism after birth in the breeding ponds, four or five large 'mops' made of strips of shade-cloth, as shown in 5.11 in PART 5, are placed with the broodstock to provide refuge for newly born fry. The fry congregate amongst the mops and in corners where they are easily netted out using large, suitably fine-meshed nets designed and constructed for the purpose. Every two to three days, fry are netted from the broodstock ponds, counted, and stocked into newly filled grow-out ponds. As mentioned, under *no circumstances* are fry allowed to remain, reach maturity and breed with their parents.

Stocking fry into grow-out; feeding (diet); harvesting. As fry are born, they are counted and stocked into 5000 litre (1320 gal) grow-out ponds progressively until there are about 1200 fry in a pond. To do this, all fry from each of the three broodstock ponds are combined into one