

# Uncovered – The Mystique of the Mud Pond

Mike Snaden continues his series about raising jumbo koi the Japanese way...



Culled koi are frequently boiled up and fed back to their siblings

## About the author:



**Mike Snaden** is the proprietor of Yume Koi in Bristol, specialising solely in very high end koi. He has supplied three out of the last four BKKS Grand Champions. Mike's specialised field is water and growing koi to their maximum potential, as a Japanese breeder would. This approach has given him considerable insight into koi.

So far, we have focussed primarily on the turbidity of the water in mud ponds working in harmony with the strong sun, to give ideal exposure to the koi's pigment cells. In the last issue, we looked at water chemistry.

Raising jumbo koi to their absolute potential is all about balancing every aspect of the pond in order to get ideal growth, ideal weight and an ideal finish to the koi's colour/skin condition. In this issue, we will look at feeding and heating.

On the subject of heat, let's first look at the Japanese summer, and how it affects the mud pond, since this is where the koi achieve their growth.

## mud pond temperatures

In Japan, koi are generally put into the mud pond around April/May and harvested in October/November. During the months of May/June the temperatures in the mud pond will usually be between 18°C and 23°C. Towards the end of June and into July, they will become much hotter, with temperatures

of 23°C through to around 28°C. Mid July sees the arrival of the rainy season, which will run for around two weeks. After this, the real summer begins!

August sees the hottest weather, with mud pond temperatures often running as high as 32°C, and sometimes even up to around 35°C. September continues to be hot with temperatures steadily running between 24°C and 30°C. In October, this drops off to around 18°C, at which point the koi will be harvested. This starts with *tosai* (koi in their first year, up to the age of one). The older koi are usually pulled up around early November.

## summer growth

During May and into June the koi will bulk up a lot, making up for weight lost during the winter months. At this time the koi will also start growing. In the rainy season (July) the acid rain and humidity cause a lot of water chemistry changes and the koi are often not fed because of fears of acidity and oxygen depletion. But the high water temperatures mean that the koi's metabolism is still very high. Consequently, the koi stretch out in length a little, losing a bit of weight. ▶

When the water temperature rises over 28°C, a koi's appetite declines greatly...

This koi came to the UK as the breeder's kashira back in 2004. She now measures 75cm as a five-year-old and will easily grow another 10cm in the next two years in her owner's pond. Such a koi would never be sold to a foreigner if the breeder wasn't 100% confident in the new owner's keeping skills.



temperatures but koi that are nisai (two years old) or older will start to struggle with the decreasing dissolved oxygen levels. As such, the summer months do have a tendency to make breeders a little nervous. The rainy season also adds the risk of the water turning acidic which is why, in some cases, breeders will throw massive amounts of crushed shells into the water at times of heavy rainfall.

## optimum temperature

Although our own ponds won't sustain good colour condition at high temperatures of 30°C, there is a definite 'upside'. Given that our ponds are very well controlled in both terms of summer heating temperatures and water hardness levels, we simply don't need to heat to such extremes anyway. To my mind, the optimum temperature for growing koi in a heated and filtered system is 23/24°C. If your water conditions are ideal and you have the keeping skills, then you can easily achieve just as much summer growth on your koi as the breeders in Japan can.

Another reason for not heating the water to 'super high' temperatures was covered in the first instalment in this series... turbidity and light! In short, the amount of available light that koi are exposed to needs to be kept linked in relation to temperature. More heat, more sun! But, if... the water is too clear, you will ruin all of your koi if heated too high and they are exposed to too much sun.

The key to getting away with too much heat is softer water and turbidity, so that the koi can moderate their own exposure to light. However, at 23/24°C, things in this department are so much simpler, carrying very little risk.

## a balancing act

Heating your koi goes hand in hand with both water hardness and feeding, whilst pH also plays a significant role. All of these things need to be kept in balance with each other if you want to get good results with your koi.

If water hardness is too high, your koi will become fat, instead of growing in length. If you try to make your koi grow by overfeeding at too low a temperature, you will get the same result. A high pH on the other hand (over eight) will result in a lack of appetite in koi. Hence, they won't eat much and therefore won't grow much.

## ideal conditions

So, as far as growing koi, the basics that I would regard as being absolutely ideal (refer to the previous two instalments in this series) are a water temperature of 23/24°C, with a pH of 7.2 to 7.3 (you can run a little lower if you are brave and experienced enough), a TDS of below 150ppm or at the least a differential of no more than 50ppm more than the fresh water supply.

In August and September the koi are fed very heavily and steadily. As a result, they put on a lot of weight, and this is when most of their growth is obtained.

If we look at the above data and apply it to our own ponds, then it becomes a little risky. You see, the water conditions (incredibly soft) and turbidity in the mud pond make the koi very forgiving of the high temperatures. But, if we were to apply temperatures of perhaps 32°C to our own ponds, we would experience many koi turning Shiro Muji (losing colour).

Even in Japan, the summer itself puts koi at risk. When the water temperature rises over 28°C, a koi's appetite declines greatly. At 32°C or over, koi will pretty much stop eating altogether. Tosai will still feed at such

...you can buy special black aquaculture dyes that will discolour the water to whatever degree you desire, without harming the koi

Water turbidity is ideal, when you can just see your koi when they are at the bottom of the pond in order to catch them if necessary. For this purpose, you can buy special black aquaculture dyes that will discolour the water to whatever degree you desire, without harming the koi. For this to work though, you need to make sure the pond gets enough daylight/sunlight.

## feeding

Feeding plays a very important role in the growing of koi. If you don't feed them adequately, they won't grow! So, let's take a look at growing in Japan.

Newly hatched fry get sent out to shallow fry ponds. The ponds are shallow for two reasons:

- 1) They run warmer temperatures.
- 2) They are easier to harvest for selections (senbetsu) to be carried out.

Once out in the mud ponds, the fry are fed four to five times a day, on a diet of fish based food, which is both natural and unnatural. By natural, I mean that the fry cannibalise each other and that the breeders boil up the rejected siblings of the koi (yes, koi do eat koi!). This sounds a little barbaric I know, but the numbers of rejected koi are just so immense that they can't simply dispose of them, so instead they recycle. It is also considered that this base of nutrition is the most useful to young koi and good for disease building resistance. Fine pellet foods are also fed, which are fishmeal based.

As for older koi, although their diet is primarily fishmeal based, their food source is also complimented by all manner of natural foods within the mud pond. During the summer, older koi are fed anything from two to four times a day. In the warmest months, these feeds are usually just in the morning and evening, as the older koi won't come up for food in the hotter parts of the day.

When it comes to feeding koi in our own 'temperature and environment controlled ponds', we are actually at an advantage over the mud pond, as we can make use of the whole summer, rather than just the bits when the water chemistry/temperatures are suitable. It is largely for this reason that you don't need to heat too high, provoking the old adage 'slow and steady wins the race!' Ok, it may not be slow, but it is steady, and consistent!

## little and often

When growing koi, it is best to spread the feeds out during the day, giving a higher number of smaller feeds. At a temperature of 23/24°C, a koi's digestive system is very efficient, so it is possible to feed a lot of food. There has been argument that feeding just twice a day results in a much higher digestion rate of the food and lower waste levels. But,



This koi is of extreme high class and came to the UK as nisai at 59cm. By the end of its first summer in the UK it had grown to 70cm as sansai (three years old). If this koi is nurtured in the best conditions, it should easily exceed 85cm as a five-year-old, and without the use of a mud pond!

this regime is of very little use when trying to grow koi. If you want to make your koi grow, you need to think about how much food will get the best results, rather than how to get the most from a given amount food!

## size matters

The feeding habits of koi vary greatly according to both their age and size. If, for example, you are growing 200 koi of 10cm in size, you will find that they will eat incredibly quickly, consuming vast amounts of food in relation to their body size, in just a few minutes. Koi of this size can make good use of 3% body weight in food per day. After a breeder feeds koi of this size the koi will look physically bloated, with bulging eyes. Yet, come back 30 minutes later and the koi will look fine again. ▶

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This koi is a breeder's 'kashira' (absolute number one of the season) and, as such, needs the absolute best conditions and feeding regime if it's true potential for the future can be realised.



in their eating habits and will often need as much as 10 or 15 minutes to slowly graze on what is offered. Here lies one of the reasons that breeders separate koi according to their size/age when it comes to putting koi into the mud pond. It is only possible to feed a pond to suit the majority of its inhabitants, as opposed to a few that are perhaps of different sizes.

## mixed sizes

Most hobbyists aren't blessed with the option of keeping different age koi in different ponds, but, I don't think this is too much of an issue. If your water and temperature are perfect and you feed the pond in a way to suit the larger inhabitants, then all that is likely to happen is the smaller koi will become too fat. With ideal growing conditions though, koi will actually tend to become slimmer as they get bigger, so further down the line they won't look so bad.

Of course, there are issues like fatty liver disease to consider. However, this isn't usually too much of a problem if the koi is too fat for perhaps its first growing season in your pond, but then becomes a little slimmer in its subsequent years. If the koi remains fat in its ensuing seasons, then it is either because the water is too hard, the water is too cold in relation to feed levels or you are simply overfeeding. If the koi on the other hand is a one off koi that feeds heavily and is fast outgrowing its siblings, then it may be worth considering moving it to another pond where it is less likely to get so much food.

## feeding cycles

One last point I would like to make on feeding is in relation to jumbo koi. As I said before, large koi need more time to feed, but, the eating habits between individual jumbo koi can vary greatly. As such, you will find that some koi go through feeding cycles, whereby they will eat very heavily for perhaps two or three weeks and then maybe spend a week sitting on the bottom of the pond with little interest in food, after which it will binge feed again! This is nothing to be concerned about, but if a number of your koi are doing this, then you are overfeeding them. This will most likely be reflected in an abundance of floating faeces.

You will always get a few 'floaters' when trying to grow your koi, so don't be too concerned. But pay attention to just how much waste is floating and cut back on the food or switch to a lower protein diet if it becomes excessive.

Next month we will focus on what to look for in a koi that you wish to grow on to become a high quality jumbo specimen. [鯉](#)

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The small fry are ones rejected during the selection process (senbetsu).

If you try to feed this 3% feed rate per day in just two feeds, you will simply find that a massive amount of food will be left floating uneaten, which in turn will pollute the water, putting the koi off their next feed as well. It is also worth noting that most of the vitamins will be washed out of the food within the first two or three minutes of floating. Hence, it is better to feed little and often to make the most of the vitamin content.

Large koi on the other hand are very lazy