

Part 2

This post is not going to change the industry into full disclosure but I think we are entitled to know what goes into the food we are spending our hard earned on

Just look at the disclosure the human food industry has to go through now, salt and sugar content, fat content and type etc they even have to disclose the country of origin why should animal feed be any different? If you are feed something that will prematurely end your fish's life your entitled to know (me thinks)

If you spent your life living on high protein food you would not last long at all, only body builder can utilise high protein diets because they are building muscle mass, if they did not draw on this excess protein they would suffer ramming this amount of protein in themselves, but look what happens to these guys when they stop, they fall apart and in some cases die early

If you lived on just carbohydrates the same would probably happen. Ill health, early death etc

Interestingly enough I have been speaking to Lisa at Cuttlebrook and unbeknown to Lisa, mark had gone back to feeding in the mid 40 percent protein from the 51% and is noticing better growth and is very impressed with the results

You don't really need to know the exact amino acid profile needed for koi, it's suffice to know that the protein that is best protein for koi/carp is derived from aquatic environment it contains most of the right amount and correct profiled amino acids and most of the valuable and needed trace elements. Animal protein is well documented as not being as good for carp/fish and harder to digest but can be used if when push comes to shove as the cooking process increases it digestibility.

Its like the typical burger from MacDonald's, this has everything you require and a lot you don't, but if you lived just on these alone I think you know what the end result would be, where as a proper balanced meal with protein and carbohydrate will serve you much, much better. But, we at least have that choice, our koi do not! As we tend to stick to one type of diet and under these circumstances that single food choice has to be right

A lot of foods out there list 40- 50 + % proteins and a lot of it is derived from animal protein and not the aquatic environment, but they don't list it, it looks good on paper but the reality is very different. Look at nature, most fish derive any protein they get from the aquatic environment (zoo plankton even other fish etc) not off the land in most cases. "shokoi impact" koi food protein is derived from feather meal at least they are honest about it so you can make an informed choice.

Let's look at some of the goodies tied up in typical types of protein used in Koi food

Animal derivatives

Meat meal

Dried mammalian tissue exclusive of: hair, hooves, horn, hide trimmings, manure and stomach contents. Protein in this would be around 51%

Meat and bone meal

Meat and bone meal would be 50% protein, fat content would be around 10% but this would be the wrong kind of lipids being mainly saturated fats. Meat and bone meal would have around 12% calcium and meat meal would contain around 3-4% less calcium. Both have high ash content around 30%

Blood meal

Blood meal is fresh clean animal blood flash dried to reduce moisture by around 70%
Minimum protein level not less than 85%

Feather meal

Feather meal is made from poultry feathers so these are not in short supply. Feathers are hydrolyzed under pressure with Ca(OH)_2 (calcium hydroxide) then dried, protein content of 80-85%, has a very low digestibility by fish but protein none the less, but highly deficient in many of the amino acids required by koi.

Poultry by-products

Waste Poultry products after processing by poultry processing plants, making chicken nuggets etc: so you can imagine what's in this. Protein content 58%, fat 13%, high in ash content.

(Ash content constitutes what is left after the meal has been heat treated at 600c)

Fish meal

Made from anchovy, capelin, menhaden, eel, herring, white fish, salmon, whiting, Pollack and may be made from whole fish.

Meal made from fatty fish like herring might contain about 71 % protein, whereas a meal made mainly from white fish and white fish offal and dried to the same extent will contain about 66% protein,

Shrimp and crab waste products contribute 40 and 32% protein respectively their ash content is high due to the high shell content, but this also contributes a good source of trace and pigment elements Carotenoid pigments

Fish meal is valuable for its high level and quality of its protein. By this I mean that the amino acids which make up the protein are present in just the right balance for fish nutrition.

Fat is present in varying quantities in fish meal from 4 to 20% again this as you have all heard this type of fat is the right kind and healthier kind of fat, as fish contains a higher proportion of unsaturated fats. The difference is that animal fats are more saturated fatty acids where as fish fats are more un-saturated fatty acids

This can be seen as solid white deposits in animal meat which are saturated fats.

Where as, you do not witness this in fish meal as it is present as a higher percentage of unsaturated fats, but the fat is there none the less as oils in the case.

Note: the technical difference between fat and oil is: Oil will be liquid at room temperature where as the fat will be solid.

Not only is the balance of amino acids in fish meal more suitable, but the availability of the essential amino acids is also greater in fish meal than any other meat meal; available means capable of being liberated by the fish and utilized by it, and essential acids are those the fish must have in its diet. The first ten amino acids in the table are those believed to be essential for the health and growing our fish.

Fish meal is also a valuable source of minerals calcium, phosphorous, magnesium, potassium, of vitamins B₁, B₂, B₆ and B₁₂, and of trace elements, notably zinc, iodine, iron, copper, manganese, cobalt, selenium and fluorine.

white fish meal

<i>amino acid</i>	<i>amino acid</i>
Lysine	6.9
Methionine	2.6
Tryptophan	0.9
Histidine	2.0
Arginine	6.4
Threonine	3.9
Valine	4.5
Isoleucine	3.7
Leucine	6.5
Phenylalanine	3.3
Cystine	0.9
Tyrosine	2.6
Aspartic acid	8.5
Serine	4.8
Glutamic acid	12.8
Proline	5.3
Glycine	9.9
Alanine	6.3

As fish are one of the slowest growing animals on the planet as they get over the initial burst of growth in the early few months to 12 months of their development their protein requirement will drop where as a large percentage of animals reach full adulthood in weeks.

Humans require only around 15% protein in their diet dogs 20-25% cats 30%, at the top end of the range being as these fish are mainly carnivorous, are salmon and trout requiring 38-40%. You can get away with feeding high protein to salmonids because they naturally feed on nothing else but living animals. But, sitting in there somewhere is the common carp at around 30% protein requirement, because of skin lustre and colour support and everything else that makes a Koi that little bit different from a common carp the mid 30% Protein but being a natural grazing omnivore must have a mixture of carbohydrate V protein

I can only draw the conclusion that folks feed high protein diets to there koi because they feel they will/can grow a huge jumbo koi, lets be clear about this, a huge jumbo koi or a small koi's size is set at birth or before birth, in its genetic code as is all the

other characteristics inherited from its parents right down to the colours and skin quality to how susceptible it will be to disease.

In the early months of life you can give any koi the means to sustain with the right amount nutrients necessary to match and keep up with this predetermined maximum potential, but in most cases you won't exceed it, but you can stunt its development. But, if you deprive the koi in its early months; of the much needed nutritional requirements. You WILL stunts its development and once this damage is done and just like a human child it will never catch up again

While we are discussing nutrition requirements, Excretion of faeces in carp has nothing directly to do with the amount of Ammonia produced. You can feed the same quantity of food but by manipulating the foods make up, either decrease or increase the amount of ammonia produced; this is because koi are termed ammonotelic, which means most of there nitrogenous waste is excreted at the gill as ammonia gas. Where as mammals excrete most of there nitrogenous waste as faeces

It's a fact the more protein you feed the more ammonia is produced by the fish and the higher the biological load on the filtration, the more ambient ammonia is present in the water the more you stunt the growth and induce health risk.

Where as the higher the carbohydrate % the less ammonia is produced the reason is: In Protein amino acids contain in various combinations mainly nitrogen, carbon and hydrogen

In carbohydrate there is a small percentage of protein anyhow but of the bulks make up it's mainly in various combinations: carbon hydrogen and oxygen but NO "nitrogen"

Carbohydrate is just simple and complex sugar molecules but there is no nitrogen in these molecules, if there is no nitrogen you cannot make directly ammonia NH_3 you cannot get ammonia because simply put the main item needed, namely nitrogen, is not present.

That does not mean you should forgo one for the other, what it means is; the two should be balanced

So what should you look for?

For me I look for food in the mid 30% protein and this must be derived from white fish meal or similar

High-ish lipids, Oil's >4% <10%

I'm not hung up on the carbohydrate coming from seaweed as this is not fast energy

Good mineral and vitamin content incidentally vitamin c is very unstable so if it's in there and or there is extra in there it must be stabilised vitamin c, also high levels of vitamins A and E – for the lustre and colour of Koi

I am not suggesting that ALL Koi food manufacturers bad and make inferior products see the previous table in part one, but there are a lot of makers out there with more appearing year on year that either do not comply with the full nutritional value of the needs of our Koi and skirt around the issue with scant descriptions of ingredients.

You would not give your pet guinea pig or rabbit a chunk of steak and expect him to get on with it why should our Koi be any different. Koi need what the rabbit or guinea pig needs, namely, the right amount and balance of nutrients from its natural environment to not only survive but to thrive, fish do not naturally chew on cattle, feathers or offal, so why feed it?

Last year I trialled loads of Koi foods in my system and some of them were truly disgusting the waste off some of them was not only excessive but was also revolting to look at

We as consumers can influence this by in effect by voting with our wallets/purses. The competition is fierce out there in the Koi food market. Good makers of Koi food are More than happy to brag about the list of ingredients and why not? They have nothing to hide and are trying to give the Koi what it requires and more power to them. But you have to appreciate; you cannot get a Bentley for the price of a Ford Escort. For us it's as simple as looking on the label to see what it's all derived from before purchase if it does not tell you or is sketchy, ask or don't buy.