Nutra-Kol is a vibrant Australian company focusing on the nutrition and health of aquatic organisms. Nutra-Kol products include feed additives and natural health solutions for the aquaculture industry. These products are the result of a unique combination of expertise in fish and shrimp nutrition, physiology and naturopathy. Nutra-Kol products are scientifically designed and tested in collaboration with commercial hatcheries, research and development centres, universities and farmers. Nutra-Kol product lines are developed to naturally improve nutrition and health of fish and crustacean broodstock and larvae. The products are categorised into 2 groups.

AQUACULTURE NUTRITION: Nutritional additives for aquaculture
- Arti-Kol
- Nutra-Brood

AQUACULTURE HEALTH: NutraGreen line – alternative herbal compound based remedies
- NutraBrood Enhance
- NutraLive
- Nutra-MetaEnhance
- NutraParagon
Nutra-Brood is a liquid feed additive designed to enhance the nutrition of fish and other marine organisms broodstock (i.e. crayfish, crabs etc.). Nutra-Brood comes as a liquid oil emulsion that can be injected into the fresh food. It contains essential fatty acids, vitamins, minerals and other essential nutrients. In many cases, a specific formulation may be required due to fish species, environmental conditions etc.

Nutra-Brood is designed to enhance the eggs and larvae quality and reduce the quality fluctuation between egg batches.

Nutra-Brood can be ‘tailor-made’ to any fish species and can include any essential nutrients such as vitamins, HUFA’s (at desired levels and ratios), carotenoids etc. Specific formulations are already used by commercial hatcheries for Seriola sp., mahi-mahi, sea bass, groupers, cod and several crustacean species.

Nutra-Brood will ensure optimal nutrition to support spawning activity prior, during and after the spawning season.

Nutra-Brood can be supplied in any quantity and to any formulation requirement. The product is applied by injecting into fresh food (sardines etc.) or mixing into broodstock diet (dry or semi-moist).

**BENEFITS**

- Natural, no synthetic or vegetable replacement
- “Tailor-made” to requirement
- Prevent any essential nutrients shortage
- Safe and beneficial for shrimp and fish
- Improve gonadal development
- Improve eggs and larvae quality

**INDICATION:** Assist and support broodstock nutritional requirements. May reduce stress and increase egg and larvae qualities.

**USAGE**

**PRE-SPAWNING:** 1-3 months prior to spawning (depends on species) 1 ml/kg brood fish once a week. Increase to 2-3 times a week, a month prior to spawning.

**SPAWNING:** 2 ml/kg brood fish, 3 times a week.

**POST SPAWNING:** reduce gradually (over a month) to 0.5 ml/kg brood fish once a week.

**NUTRABROOD GROUPER**

Specifically designed for Epinephalus sp. and Plectropomus sp. increasing sperm motility and fecundity.
Arti-Kol is a concentrated live feed enrichment emulsion designed to enhance the nutrition profile of rotifers and Artemia. Arti-Kol is designed to improve the stress resistance and the immune system of fish larvae.

In many cases, the determination of nutritional requirements of fatty acids and other nutritional components is achieved by comparing commercially available enrichments differing in their EFA or other nutrients.

In some cases, especially with new species or susceptible larvae or for nutritional trials, different levels and/or other ingredients are needed in the enrichments. Currently, there are no commercially-available 'tailor-made' enrichments aimed at research institutes as well as commercial hatcheries.

Unlike any other off-the-shelf commercial enrichments, Arti-Kol is a ‘tailor-made’ enrichment that can be designed to suit any nutritional requirements. Arti-Kol is very easy to use and the cleaning process of live feed after the enrichment process is fast and easy, leaving no particles, clumps (as the case with some commercial products) or oil residues.

Arti-Kol users include: commercial hatcheries (especially hatcheries working with new species and/or sensitive species), universities and R&D centres (Arti-Kol is ideal for any larval nutritional studies).

Arti-Kol can be supplied in any quantity and to any formulation requirement.
One of the problems with shrimp (and other crustacean) culture is broodstock diets and nutrition. Currently, most hatcheries around the world are using fresh or frozen squid, worms (polychaetes), fish and other marine organisms, topped up with nutritional additives. This practice is far from ideal, exposing the cultured animals to potential pathogens and diseases, nutritional inconsistency and is dependent on wild fisheries. Considering the cost of broodstock (especially ‘SPF’), these are serious risks and in many cases result in high mortality and/or reduced productivity, leading to significant financial loss.

Until now, broodstock fed maturation formulated dry diet, pelleted or extruded did not match the performances of animals fed on fresh/frozen food. The dry diets tend to break down due to the unique feeding behaviour of the animals, resulting in polluted water and very high FCR. Moreover, palatability and ingestion rates are usually low.

NO MORE!

Nutra-Kol developed maturation diet (NutraFeed® diet range) for crustacea that can completely replace the use of fresh/frozen feed. The diet is semi-moist and manufactured as short pellets at any length and diameter needed. The diet is stable in the water for 24 hours and will not break down when the shrimp or lobster is holding and chewing it.

NutraFeed® diets were tested with several crustaceans including; white shrimp *L. vannamei*, tiger prawn *P. monodon* (wild and domesticated), bugs (*T. orientalis*) and tropical lobster (*Panulirus ornatus*). The diet can be designed and manufactured for any crustacean.

NutraFeed® diets are based solely on dry meals without any fresh or frozen products. They are pathogen free (all ingredients pass Gamma radiation) with a shelf life of six months (refrigerated) or 12 months (frozen).

Herbal extracts (NutraGreen®) are incorporated into the diets. These 100% natural additives aimed at improving broodstock performances including: enhancing egg and larvae quality, sperm motility, vitellogenesis, as well as immune system and digestive system support.
Three different maturation diets are manufactured according to species: NutraFeed® SM for shrimps and prawns, NutraFeed® LM for lobsters and bugs and, NutraFeed® CM for crabs.

Several experiments and commercial trials were conducted independently by some of the biggest shrimp producers in the world, comparing NutraFeed® SM to traditional squid, polychaetes and nutritional additive diets. The results demonstrated significant performance improvements (up to 40%) when the broodstock (both *P. vannamei* and *P. monodon*) fed on NutraFeed® SM semi-moist diet. Moreover, using the semi-moist diet also proved to be cost effective compared to traditional diets.
Aquaculture production and trade is currently limited by disease outbreaks, nutrition and low larval survival. Microbial disease activity has increased dramatically, along with the degree of intensification in larval production in aquaculture.

The development of drug-resistant fish pathogens has been reported from all areas of aquaculture. Microbial infections in fish and crustaceans are currently treated by dissolving higher quantities of broad spectrum, chemotherapeutic agents. Most of these antibiotics and drugs are banned for use in EU, USA and many other countries.

The NutraGreen range of products are designed to overcome these problems. These products offer alternative herbal-compound based remedies. Natural plant origin products present a viable alternative to antibiotic and other banned drugs, being safer for the reared organism and humans, as well as for the environment.

All NutraGreen products are based on 100% herbal extracts approved and listed for human use with the Australian Therapeutic Goods Administration.
Live food (rotifers and *Artemia*) is considered to be a vector for bacterial infections in marine larvae, resulting in reduced growth and survival. During the hatching and enriching process, bacterial numbers increase by 5-8 fold. These bacterial populations remain well established and are very hard to remove from within the nauplii by rinsing with freshwater. Some commercial synthetic disinfectant products are being used in some countries, however, most of them are banned for use in EU, USA and other countries.

NutraLive is a scientifically designed blend of herbal ingredients that effectively reduce bacteria, viral and fungal pathogens in live feed (*Artemia* and rotifers). NutraLive lessens and controls bacterial numbers during hatching and, when used in conjunction with Arti-Kol live food enrichment or any other commercial enrichment, suppresses any bacterial blooms which would normally occur during the hatching and enrichment procedures.

**BENEFITS**

- Increases vitality of freshly-hatched *Artemia* and rotifers
- Higher larva survival rate
- Effective feed utilisation through improved conversion
- Increases resistance to specific and non specific infections
- Prevents production losses during adverse environmental and management conditions
- Natural and safe with no side effects for shrimp and fish
- No risk of emergent antibiotic resistance
- No residue and environmentally friendly

INDICATION: Reduced and spressed microbial pathogens in live feed organism culture.

**USAGE**

Use in conjunction with rotifers and *Artemia* live food enrichment.
NutraBrood Enhance

Broodstock are the key for any successful fish hatchery. Maintaining broodstock at good health and at optimum nutrition is vital for high quality eggs and larvae.

Hormone induced spawning is used in hatcheries where an environment significantly differs to a natural state, such as when inducing spawning out-of-season. Non-acute stress of hatchery environments may result in lower fecundity and larvae quality, higher deformities and lower stress tolerance.

NutraBrood Enhance is a natural combination of herbal extracts that are specifically designed to reduce stress and regulate the hormonal cycle. NutraBrood Enhance formulation includes adaptogenic, hepatoprotective, antioxidant and immunomodulator herbal extracts. NutraBrood Enhance is a non-hormonal and non-steroidal aid for reduction of stress, immune function and performance enhancer, as well as, environmental control of maturation and imparts of stress on broodstock, gametes and progeny.

**BENEFITS**

- Stimulates spermatogenesis in male fish and aid gonadal maturation and high egg viability in female fish
- Helps achieve natural viable spawns, especially out-of-season
- Improves egg quality and fecundity
- Non-natural spawning or low egg producing broodstock
- Low sperm quality, sperm volume, cell concentration, sperm production and motility
- Improves hormonal and cellular immune response
- Increases resistance to specific and non specific infections
- Enhances hepato-pancreas activity and thereby efficient digestion and assimilation of feed nutrients
- Reduces environmental and physical stress during and after spawning season
- Maintains feed intake during inclement weather
- Natural and safe with no side effects for shrimp and fish
- No risk of emergent antibiotic resistance
- No residue and environmentally friendly

**INDICATION:** Supports broodstock health and enhance gonadal development.

**USAGE**

Inject or include in the fresh diet (fish, squid, etc.)

Different doses are given during pre-spawning, spawning and post-spawning seasons.
Parasites are an integral part of any aquatic environment and can often be found on wild fish. In aquaculture, where conditions are usually sub-optimal, chances of infection are increased through raised stress levels in fish which directly effects their immune response.

Poor immune response reduces the ability of fish to fight pathogens and parasites. It gives parasites the opportunity to proliferate, causing serious health issues and ultimately can prove fatal to the host fish if left untreated.

Chemicals such as hydrogen peroxides, formalin, and other chemotherapeutants may offer a short term solution against parasitic problems. In sea cages, bathing fish is a labour-intensive and costly operation. Although this usually brings temporary relief from parasites, the treatment also causes stress to the fish and increases the chances of future infections.

Many of these chemicals are not environmentally sustainable and most of them are prohibited for use in aquaculture systems and banned in many countries.

NutraParagone contains powerful natural compounds with antimicrobial, antibacterial, antiparasitic, antifungal and anthelminthic herbs. These may improve poor digestive function, alleviate worm and Candida infections and internal and external parasites (flukes).

**BENEFITS**

- Chemical free, environmentally friendly, non-invasive and rapidly biodegradable
- Controls itch and other external protozoan, dinoflagellate, flukes and fungal diseases
- Controls the proliferation of pathogenic vibrio bacteria
- Works in fresh and salt water
- Safe and beneficial for shrimp and fish
- No residue and environmentally friendly

**INDICATION:** Eliminates or reduces external and internal parasites.

**USAGE**

Application through spray or mix with food.
The metamorphosis stage in fish larvae marks the transition to the definitive phenotype of all the body systems, such as; digestive system, visual and olfactory, skeleton, muscles, skin, pigmentation and behaviour. This transformation process from 'embryo' to fully developed fish demands high physiological and nutritional resources from the larvae. Therefore, if larvae arrive at this stage in a condition that is not optimal, its chances of survival deteriorate significantly.

Stress caused by sub-optimal nutrition, bacteria, environmental conditions and other factors is believed to be an important factor affecting larvae survival. It can lower immunity, which leads to increases in susceptibility of fish, prawn and shrimp to various specific and non-specific infections.

Nutra-MetaEnhance, a unique combination of natural herbal extracts, reduces stress, improves immune response (immunomodulator) and helps in adapting to adverse environmental conditions.

**BENEFITS**

- Higher larval survival rate by hepato-pancreas protection
- Effective feed utilisation through improved conversion rates
- Prevents stress-induced viral and bacterial infections
- Promotes growth for higher body weight gain
- Natural and safe with no side effects for shrimp and fish
- No risk of emergent antibiotic resistance
- Free from toxic chemical residue
- Works in fresh and salt water
- Environmentally friendly for broader spectrum use

**INDICATION:** Reduces stress and increases survival and growth during metamorphosis stages, grading and weaning.

**USAGE**

Use in conjunction with *Artemia* live food enrichment during metamorphosis and weaning, as well as grading. Application can be through diets (dry or wet) or by bath.
### Usage, Application and Ingredients

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>SPECIES</th>
<th>PRODUCT</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine oils / Fatty acids</td>
<td>Marine, Larval, Artemia, Crustaceans, Fish</td>
<td>Nutra-Brood</td>
<td>Nutritional additive / booster for optimal nutrition and supporting digestive system, encouraging spawning. Can be used in warm water. Mix in water or coat dry pellets.</td>
</tr>
<tr>
<td>Vitamins</td>
<td>Marine, Larval, Artemia, Crustaceans, Fish</td>
<td>Nutra-Feed</td>
<td>Nutritional additive / booster used in conjunction with Nutra-Brood. Mix in moist diet or coat dry pellets.</td>
</tr>
<tr>
<td>Glucans</td>
<td>Marine, Larval, Artemia, Crustaceans, Fish</td>
<td>NutraBrood Enhance</td>
<td>Natural hormone booster and immune modulator for reducing stress and improving reproductive performance. Mix in water or coat dry pellets.</td>
</tr>
<tr>
<td>Carotenoids</td>
<td>Marine, Larval, Artemia, Crustaceans, Fish</td>
<td>Nutra- MetaEnhance</td>
<td>Herbal immunomodulator for increasing growth and reducing mortality during metamorphosis and other stress-related stages of larvae. Mix in water or coat dry pellets or bath.</td>
</tr>
<tr>
<td>Amino acids</td>
<td>Marine, Larval, Artemia, Crustaceans, Fish</td>
<td>NutraParagone</td>
<td>Natural herbal extracts for eliminating or reducing internal and external parasites. Mix in water or coat dry pellets or bath.</td>
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### APPLICATION

- **Nutra-Brood**: Inject to fresh feed, mix in moist diet or coat dry pellets.
- **Nutra-Feed**: Direct feed.
- **NutraBrood Enhance**: Inject to fresh feed, mix in moist diet or coat dry pellets.
- **Nutra- MetaEnhance**: Inject to fresh feed, mix in moist diet or coat dry pellets or bath.
- **Nutraparagone**: Inject to fresh feed, mix in moist diet or coat dry pellets or bath.

**Arti-Kol**: Tailored live feed enrichment design for species nutritional requirements and/or R&D requests. Mix in water. Suitable for semi-mature live feed for complete or partial replacement of frozen feeds. SPF certified. Contains NutraBrood Enhance.

**NutraFeed**: Direct feed. Semi-mature live feed enrichment design for species nutritional requirements and/or R&D requests. Mix in water. Suitable for semi-mature live feed for complete or partial replacement of frozen feeds. SPF certified. Contains NutraBrood Enhance.