



FISH BROODSTOCK DIETS

THREE PREMIUM CHOICES

Even though complete substitution diets are available, broodstock is still fed a substantial amount of trash fish, a highly risky and variable product in terms of hygiene and nutrition. Broodstock management is therefore a key activity for all hatcheries.

INVE Aquaculture now offers you full flexibility with three highly nutritional and 100% safe diets, each with their own unique characteristics, to enhance the nutritional quality of the offspring AND to provide a more predictable output.

Lansy Breed *Essential* or *Performance*
Ready to use pellets, each with their own nutritional characteristics, perfectly adapted to your needs.

FISH BREED-M
A powdered diet that allows you to easily make your own feed sausages or paste.

1 **Lansy Breed**
Performance

2 **Lansy Breed**
Essential

3 **FISH BREED-M**

1 Lansy Breed Performance



8 mm

Lansy Breed Performance has been designed to meet the highest quality standards in terms of raw material and production, producing the best quality diet for your broodstock.

Lansy Breed Performance can be fed anytime during the year to condition the broodstock. Start feeding at least 4 months prior maturation and during all the spawning time. Feed daily at 0,5% of the fish biomass or feed "ad libitum".

Available in a single 10 kg bag.

	Lansy Breed Performance	Lansy Breed Essential
Crude Protein (min-max)	47 - 52 %	47 - 50 %
Crude Fat (min-max)	15 - 17 %	15 - 17 %
Starch (min-max)	8 - 13 %	8 - 13 %
DHA/EPA	2.2	1.9
n-3 HUFA (min)	38 mg/g	38 mg/g
Crude Ash	14.5 %	14.5 %
Total Phospholipids (min)	1.5 %	n/a
Astaxanthin (min)	50 ppm	n/a
Vitamin E	1000 mg/kg	150 mg/kg
Vitamin A (min-max)	12,500 - 14,500 mg/kg	12,500 - 14,500 mg/kg

2 Lansy Breed Essential



8 mm



16 mm

Specifically formulated to obtain the best balance among quality and cost **Lansy Breed Essential** is the perfect broodstock diet for an all round use. When compared to **Lansy Breed Performance**, this diet contains the same sources of intact proteins and fatty acids based solely on marine ingredients. It contains the same level of dietary lipids and fatty acids, but a slightly lower DHA/EPA ratio. Additionally, it contains an extremely attractive oil source based on a marine invertebrate which greatly increases the palatability of the diet.

Lansy Breed Essential is rich in fatty acids to improve egg quality and embryo development. It can be fed any time of the year - including during the spawning time - at a daily rate of 0.5% of the fish biomass (or feed "ad libitum").

The bigger pellet size (16 mm) is produced specifically for large size broodstock species like Asian Seabass, grouper, etc.



IMPORTANT BUILDING BLOCKS FOR GOOD QUALITY BROODSTOCK

Crude Fat (Fatty acids)

These are the major source of metabolic energy from egg to adult stage and also for reproduction. The content of dietary lipid in the broodstock diet as well as the essential fatty acids have a major impact on the spawning quality. The latter greatly influences the fatty acid composition of the male gonad and sperm quality. Furthermore, in many fish species, there is a selective retention of docosahexaenoic acid (22:6n-3) content during embryogenesis and starvation in larval stages. **Lansy Breed Performance** contains various sources of marine fish oils with high levels of essential fatty acids to support this.

Protein and amino acids

Marine broodstock need a high intake of protein so they can acquire amino acids, which are then used either for growth and reproduction or overall maintenance of the body. **Lansy Breed Performance** is formulated using high quality marine proteins, hydrolyzed proteins and a well-balanced mixture of various indispensable free amino acids.

Supplements

Certain compounds with an antiviral, antimicrobial or anti-inflammatory characteristics are included to modulate the immune system of the broodstock and to improve their resistance against diseases. Additionally, **Lansy Breed Performance** contains dietary supplements in order to improve resistance to a pathogen insult.

Carotenoid sources

These have proven to increase survival and growth of larvae and juveniles when supplemented in broodstock feed. It is shown that carotenoids can be effectively utilized by the broodstock and be directly deposited into the eggs.

3 FISH BREED-M

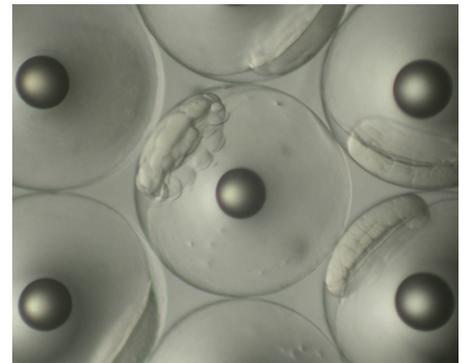
FISH BREED-M is a powdered broodstock diet that incorporates highly refined and digestible raw materials, making this dry mix perfectly suitable as a stand alone feed.

Mixed with water, the powder can be made into a stable moist paste or moist sausages because of ingredients with specific binding capacities.

FISH BREED-M fulfills the nutritional needs of the broodstock animals, as well as the needs to obtain optimal egg and offspring quality. The included raw materials are highly digestible, while the attractiveness is ensured by the inclusion of several marine meals and selected attractants.

It can be fed all year round to fish broodstock and thanks to the nature of preparation it can be easily integrated with specific in-house ingredients.

- Protein, lipid and micro-nutrient levels are optimally balanced.
- Highly digestive marine proteins to reflect the natural diversity of protein intake,
- Maximized protein levels (62%)
- Balanced amino acids
- High HUFA levels (sum (n-3) > 35 mg/g)
- High DHA/EPA ratio of >2.5
- Supplementation of marine phospholipids
- High vitamin and mineral levels
- Emphasis on vit. E + C to prevent stress and lipid oxidation in the tissue of the fish
- High vit. B1 inclusion to compensate for possible thiaminase activity of fresh fish
- High vit. B2 level for its specific role in the reproduction cycle
- Inclusion of natural pigments and attractants
- Taurine ensures attractivity and successful larval metamorphosis and pigmentation



INSTRUCTIONS FOR USE

A) As a complete moist pellet

- ① Weigh the required amount volume of powder
- ② Mix in blender with fresh water (± 50% of the wet weight) until a semi-moist paste has been created
- ③ Cut into small portions or pellets to preferred size

B) As a filling for feed sausages

- ① Weigh the required amount volume of powder
- ② Mix in blender with fresh water (±50% of the wet weight) until a semi-moist paste has been created
- ③ Extrude through a meat mince
- ④ Feed as such or as filling of feed sausages

TYPICAL COMPOSITION

crude protein	60%
crude oils and fats	15%
crude ash	13%
ash insoluble in HCl	3.6%
calcium	1.6%
phosphorus	1.5%
crude fibre	1%
sodium	0.9%
DHA	20 mg/g dwt
EPA	10 mg/g dwt
ARA	1.1 mg/g dwt
Vitamin A	25,000 IU/kg
Vitamin D3	5,000 IU/kg
Vitamin C	5,000 mg/kg
Vitamin E	600 mg/kg
Ethoxyquin	120 mg/kg
BHA	20 mg/kg
Propyl gallate	10 mg/kg

Note: Do not feed the powder directly to the fish. The product is to be prepared only by adding fresh water, minimizing the risk of pathogen import. Feeding needs to be applied at 0.3% to 0.5% of the live biomass per day. Begin feeding 3 months prior to spawning and feed until 1 month after spawning has finished.

Lansy Breed Performance Essential Lansy Breed Performance Essential FISH BREED-M Lansy Breed Performance Essential Lansy Breed Performance Essential Lansy Breed Performance Essential FISH BREED-M Lansy Breed Performance Essential Lansy Breed Performance Essential

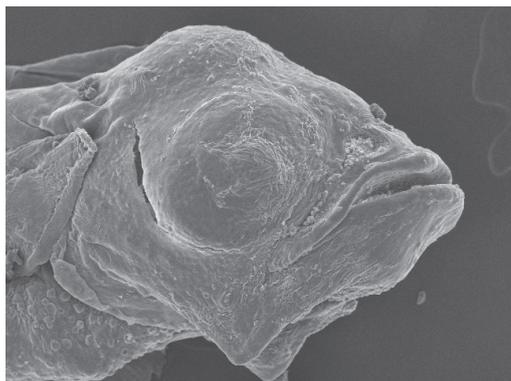
QUALITY & SUSTAINABILITY

Our broodstock diets (both Lansy Breed and FISH BREED-M) are formulated using premier marine ingredients, selected following INVE Aquaculture's stringent quality requirements. They do not contain feed materials derived from terrestrial animals, are GMP certified and in 2015 will be both HACCP and GlobalGap certified as well.

We source our ingredients only from certified and respected suppliers.

With regards to sustainability: as of 2013, INVE Aquaculture has applied criteria for sourcing fish meals and fish oils. These ingredients are purchased from suppliers whose products originate from responsibly managed fisheries (through IFFO RS certificates or equivalent).

Lansy Breed Performance Essential Lansy Breed Performance Essential FISH BREED-M Lansy Breed Performance Essential Lansy Breed Performance Essential Lansy Breed Performance Essential FISH BREED-M Lansy Breed Performance Essential Lansy Breed Performance Essential



Head of 11 DPH seabass larva.
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THE IMPORTANCE OF A BALANCED DIET

Despite the well-documented beneficial effects of a balanced diet to the egg production and fertilization - and subsequently the larval quality - the specific nutritional requirements of broodstock fish are still largely under investigation. The nutritional value of the diet, the feed intake rate and the duration of the feeding period can all have an effect on the quality of spawning, eggs and larvae.

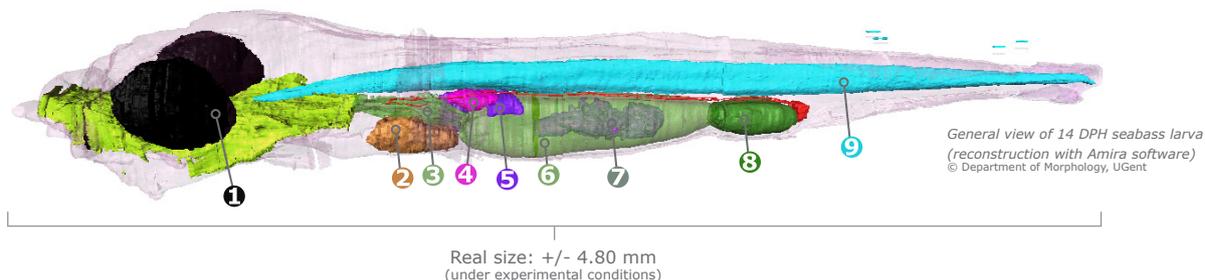
During the sexual maturation and spawning period, sea bream broodstock continues to eat and produces an egg biomass comparable to its own body weight. Taking this into account, the nutrients deposited in the ovaries might be directly influenced from the broodstock diet, therefore the nutritional value of the eggs can be changed during the spawning period and have a beneficial effect on the spawning quality if fed with a balanced diet. In general, sea bream eggs are more easily affected by the diet compared to sea bass, where vitellogenesis takes place a bit longer.

AM I USING A QUALITY BROODSTOCK DIET?

When determining the quality of a broodstock diet, it is important to look at:

- the fertilization rate
- cleavage symmetry of the 8- & 32-cell stage
- survival rate during the egg stage
- survival rate during hatching

- | | | |
|-------------------------|-----------------------|----------------------------------|
| 1 Eye | 4 Swim bladder | 7 <i>Artemia</i> nauplius |
| 2 Liver | 5 Pancreas | 8 Hindgut |
| 3 Gastric region | 6 Midgut | 9 Notochord |



Larval quality is mostly evaluated in yolk sac larvae before the start of exogenous feeding as first feeding will significantly affect the outcome of a nutritional trial. It is also interesting to take into account a developmental pattern in fish embryology compared to other vertebrates. All embryos of vertebrates, with exception of the teleosts, have a digestive tube open to the yolk sac, suggesting a direct absorption of the yolk. With fish this is not the case, as the intestine remains distinct from the yolk mass. In general, in fish, the major functions of yolk sac circulation is, next to gaseous exchange, excretion and uptake, the distribution to the embryo of nutrients contained in the yolk itself.

HOW TO JUDGE IF THE LARVAE'S NUTRITIONAL DEMANDS ARE COVERED?

Nutritional demands of larvae can be covered through the yolk. Well-balanced broodstock diets supplemented with an adequate amount and type of dietary protein being vital for the embryo.

In general, pelagic eggs contain high levels of free amino acids. Furthermore, increased fecundity or increased egg size, higher larval length and weight can be significantly improved with the right type of dietary lipids. The dietary improvements of eggs can be fine-tuned with correct addition of types of vitamins, minerals, carotenoids, and immunostimulants.

Finally, as egg and larval quality form the basis for successful aquaculture, broodstock quality forms the basis for healthy egg development. A good reason to ask always for the best feed.

For more information, please contact your local INVE Aquaculture Service Center or take a minute to visit our website: www.inveaquaculture.com

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