



ZEBRAFISH 4 NUTRA

Fast-track robust food claims



Biotechnology Assets, S.A.
corporatecommunications@biatgroup.com
www.biatgroup.com



Introduction: Why Zebrafish Models Matter for Food Ingredient Claims

Leveraging Zebrafish in Food Ingredient Research and Marketing



Genetic similarity to humans

Over 80% genetic homology with humans makes zebrafish a reliable model for studying health effects of food ingredients.



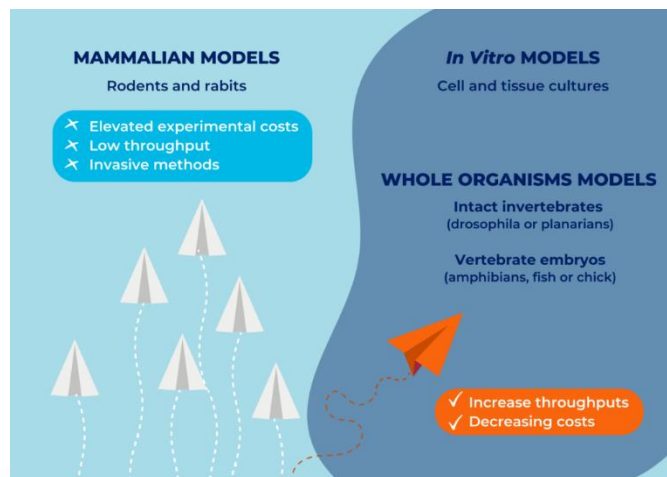
Efficient and ethical testing

Zebrafish are transparent and develop rapidly, allowing for real-time observation of organ and system effects while reducing reliance on traditional animal testing.

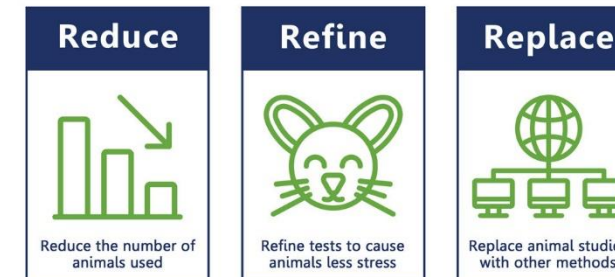


Regulatory acceptance

Zebrafish models are increasingly accepted by global regulators for toxicity testing, supporting faster market entry for products with validated health claims.



The 3 R's of Animal Research



Zebrafish models are a powerful tool in food ingredient development, offering both scientific rigor and cost-effective solutions. Their high genetic similarity to humans enables the study of ingredient impacts on health outcomes, such as metabolism, cognition, and inflammation. In addition, zebrafish models allow for real-time observation of developmental and organ-specific effects, speeding up the process of validating ingredient safety and efficacy claims. As global regulators increasingly recognize zebrafish research, companies can leverage these findings to strengthen their marketing claims and accelerate product approvals.



Zebrafish-Validated Marketing Claims

Leveraging Zebrafish Research for Stronger Claims



Cognitive health claims

Zebrafish models provide robust data for brain health benefits, demonstrating ingredient effects on cognitive function and neural pathways.



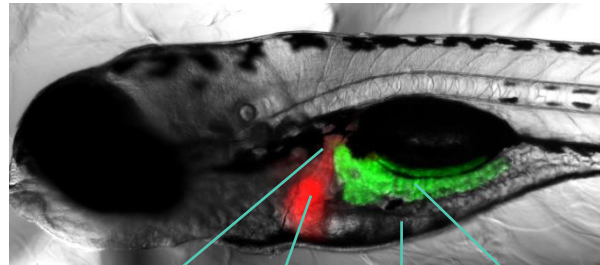
Gut and digestive health

Zebrafish models offer insights into gut microbiota and digestive system interactions, supporting claims about improved digestion and probiotic efficacy.



Cardiovascular benefits

Validated studies show how food ingredients affect zebrafish heart function, oxidative stress, and lipid metabolism, backing claims for heart health.



Gallbladder

Liver

Intestine

Pancreas

Zebrafish digestive system is similar to human's

Using zebrafish models, companies can make well-supported claims about the cognitive, digestive, and cardiovascular benefits of their food ingredients. For example, cognitive health claims can be backed by studies showing how ingredients like omega-3 affect brain health and neural activity in zebrafish. Similarly, gut health and digestive claims are supported by research into how probiotics and fibers influence gut microbiota and digestion. Finally, zebrafish provide reliable data for cardiovascular claims by measuring heart function, oxidative stress, and lipid metabolism responses to key bioactives.



ZF MODELS AND IMPACT

ZF metabolic models and evaluations:

- ✓ **Obesity**
- ✓ **Diabetes**
- ✓ **Neurodegenerative diseases**
- ✓ **Mood disorders**
- ✓ **Immunosystem (antiinflammatory)**
- ✓ **Locomotor**
- ✓ **Angiogenesis**

Scientific validation:

- SHAO, Rui, et al. **Vitamin D regulates glucose metabolism in zebrafish (*Danio rerio*) by maintaining intestinal homeostasis**. The Journal of Nutritional Biochemistry, 2024, vol. 123, p. 109473.
- HUI, Chung Man Jessica, et al. **Utilization of zebrafish larvae to monitor gastric motility in diabetes mellitus: targeting GLP-1 and GIP receptors**. The FASEB Journal, 2022, vol. 36.
- BERTELLI, Pablo Ricardo, et al. **Anti-stress effects of the glucagon-like peptide-1 receptor agonist liraglutide in zebrafish**. Progress in Neuro-Psychopharmacology and Biological Psychiatry, 2021, vol. 111, p. 110388.
- FALCINELLI, Silvia, et al. **Probiotic treatment reduces appetite and glucose level in the zebrafish model**. Scientific reports, 2016, vol. 6, no 1, p. 18061.





How Zebrafish Accelerate Time-to-Market

Reducing Costs and Enhancing Efficacy in Ingredient Claims



Cost-effective testing

Zebrafish models reduce costs by offering high-throughput testing, allowing companies to test multiple compounds quickly and efficiently.



Rapid regulatory acceptance

Data from zebrafish studies are increasingly recognized by regulatory bodies, helping companies shorten the product approval process.



Faster claim validation

With rapid metabolic and developmental insights, zebrafish provide faster evidence for marketing claims, helping to accelerate time-to-market.

	 In vitro	 Drosophila/Worm	 Zebrafish	 Mammals
Cost	€	€€	€€	€€€€
Capacity	+++++	++++	++++	++
Biologic Relevance	+	+	+++	++++

Zebrafish models offer several distinct advantages when it comes to reducing costs and time-to-market for new food ingredients. They enable high-throughput testing, allowing companies to test many compounds at once, saving both time and money. Moreover, zebrafish data is increasingly accepted by regulatory agencies, ensuring that claims can be validated faster and with fewer obstacles. These factors make zebrafish models a powerful tool in bringing products to market faster, with well-supported health claims that resonate with consumers and regulatory bodies alike.



MAIN CLIENTS



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WHO? Biobide: www.biobide.com

Biobide is a Biotech company with more than 18 years of **experience** offering **Zebrafish** Services to Pharmaceutical, Biotech, Nutraceutical and Chemical companies under Good Laboratory Practices (GLPs).

Our main aim is to accelerate our Clients' R&D process by minimizing risks using zebrafish alternative model, adding value mainly in early phases through **disease model generation**, **toxicity** and **efficacy** assays

With facilities in Spain (San Sebastián) and delegation in USA (Boston), BBD has **international top clients** in different business areas.

Biobide's Team presents **unique deep knowledge** on safety, **efficacy** and ecotoxicity testing using model organisms such as Daphnia, Zebrafish and Algae, powered by **Artificial Intelligence** (Image Analysis).