# Better Bites for Pets and Aquaculture Animals

## Improving the Texture of Animal Food Using Vital Wheat Gluten (VWG) & Rice Starch

Pets are a key part of many people's lives around the world. Globally, pet food market sales stood at USD 115.50 billion in 2022 and is expected to climb to USD 163.70 billion by 2029 as a result of new innovative products[9]. Owing to pet humanization and the growing bond between pet owners and their pets, consumers are willing to spend more on pet food. For that reason, it has sparked a robust demand for a wider variety of high-quality pet food products and a taste for new experiences[13].

The aquafeed market is also seen as active and dynamic due to the increasing seafood demand. Approximately, 50% of all fish consumed by humans comes from aquaculture[14] and



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according to Fortune Business Insights report, the global aquafeed market was valued at $58.19 billion in 2021 and is expected to reach $85.17 billion in 2028[8].

**Optimizing the Technological Quality of Pet Food**

Pet foods or treats are generally available in three forms: moist, semi-moist, and dry, depending on their final moisture content[15]. Whether it is pureed, shredded, cubed, cut, jellied, gravied, chewy, soft, crunchy, hard, or otherwise, final product texture is paramount[18].

**Vital Wheat Gluten: An Excellent Texturizer for Pet Food**

Vital Wheat Gluten (VWG) consists of naturally occurring protein gliadins, which are responsible for viscosity, and glutenin, giving elasticity to pet food products[16]. Thanks to this strong bind, they both form a strong viscoelastic matrix with a high-water absorption bind that gives them a texture similar to the meat[3,16]. VWG also can improve juiciness due to its excellent water-holding capacity which becomes a crucial part of the palatability in all chunks-in-gravy type pet foods[3].

*Technical Benefits of VWG in Pet Food*[6]

- *High water absorption capacity thanks to good binding capacity (strong viscoelastic matrix)*
- *Increased juiciness and chewiness (texture) in (semi-)moist (e.g., chunks in gravy) pet nutrition*
- *Improved chunkiness*
- *Lighter, crunchier kibble in consequence of optimal porosity, volume, stability, and texture in dry extruded pet nutrition*

**Rice Starch: A Clean Label Solution for Sensitive Pets**

Rice starch can optimize extruded pet snacks and treats especially in dry pet food. With its high hot set temperature, it improves the porosity and uniform surface, allowing for a good level of crispiness and crunchiness in the final product[3]. Therefore, it is ideal to be used in products that are aimed at young or sensitive pets and in hypoallergenic pet foods[4].

*Technical Benefits of Rice Starch in Pet Food*[6]

- *High-quality binder for controlled expansion in dry extruded pet nutrition*
- *Uniform kibble with fine porosity, improved crunchiness, and smoother surface*
- *Low retrogradation in wet canned pet foods (natural stabilizer)*
- *Good moisture binder (e.g., cohesive gravy matrix)*
- *Clean label alternative to hydrocolloids in wet pet nutrition*

**Optimizing the Technological Quality of Aquafeed**

Aquafeed pellets are commonly used to feed aquaculture animals where the extrusion process becomes the primary technique for a better feed quality[11]. Other than that, in order to gain a maximum yield of fish, the feed also requires an appropriate ingredient and processing technique[17]. This in turn will determine the qualities of feed such as pellet shape, size, water absorption quality, density, softness or stability, and floating time[10].

**Vital Wheat Gluten: An Optimal Binder for Aquafeed**

Vital wheat gluten (VWG), a natural protein extracted from wheat is a water-insoluble protein characterized by visco-elasticity properties when hydrated[16]. It offers perfect properties to provide the binding needed for the pellet in an extruded feed[1]. Moreover, due to its water insolubility properties, it can reduce the breakdown of the feed pellet in water[14]. VWG also improves the water stability of the extruded pellet and absorbs more water which leads to increasing feed efficiency and reducing water wastage[12].

*Technical Benefits of VWG In Aquafeed*[5]

- *High-quality, natural binder*
- *High water absorption capacity and prevention of gas expulsion during extrusion*
- *Improved water stability of the extrudate*
- *Delivery of fine porous and uniform extrudates*
- *Higher oil inclusions*



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**Rice Starch: An Extrusion Enhancer**

Poor or insufficient water stability can break the feed fast. Thus, the use of appropriate binding agents is what mostly determines the stability of aquafeed pellets[10]. Rice starch has an important feature of gelatinization and non-crystallization which act like a binder and increase the durability of pellets[17]. In the extrusion process, upon exiting an extruder, the feed undergoes a sudden drop in pressure causing rapid moisture loss and volume expansion. As a result, it creates a smooth and uniform porous texture of the pellet[7,11] and allows it to absorb oil, meeting the fish's nutritional requirements, and achieve the optimum pellet buoyancy[2].

*Technical Benefits of Rice Starch in Aquafeed*[5]

- *High-quality vegetal binder*
- *Reduced expansion rate to improve sinking and buoyancy*
- *Uniform and smoother extrudates with a fine porosity*
- *Enabling higher oil inclusions (achieving nutritional requirements)*

**The Right Balance**

When formulating pet or aquafeed products, it is important to choose the right ingredients to achieve ta good balance between the final product's integrity and texture. At DPO International, we are honored to be in partnership with **Beneo** to bring you a range of ingredient choices that will elevate the quality of your animal nutrition product.

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