

Raising the bar: Egg white proteins overcome sensory & shelf life challenges in high protein snacks

12 Aug 2020 --- Dutch company Bouwhuis Enthoven BV has introduced two new egg white protein ingredients under its Eggcellent brand. Both components are "exceedingly high in protein content," but contain no fat and carbohydrate. Combined with their versatile functional properties, these novel ingredients enable companies in the lifestyle and sports nutrition markets to improve the quality of their high-protein snacks and create new structures, the company notes. Speaking to FoodIngredientsFirst, Astrid Kemper, Business Development Manager at Bouwhuis Enthoven, explains how the ingredients help overcome sensory and shelf life challenges in high-protein snacks.

Nutritional snacks, particularly high-protein bars, are among the biggest growth areas in the lifestyle food market – but there can be no compromise on taste and quality. "This can pose some persistent challenges, as bar hardening and off-flavors can limit their shelf life and reduce sensory quality." Bouwhuis Enthoven's two egg white proteins can avoid these pitfalls, Kemper asserts.



The company influenced the characteristics of egg white proteins that are important for the optimal sensory quality of snack bars.

For protein enrichment of foods, protein ingredients with a very high protein content are preferred by product developers, she says. "Low salt and no fat or carbs in the protein ingredient add to this appeal since this makes formulation of healthy foods much easier and minimizes the risk of unwanted chemical reactions leading to sensory defects." In addition, the nutritional properties of egg white make it, from a nutritional standpoint, a logical choice for protein enrichment.

Currently, most sports nutrition products are formulated using dairy proteins, but as egg white proteins have very different physical properties from dairy (or plant) proteins, they can expand the product developer's toolbox with new textural possibilities.

"We can tailor egg white proteins to have different gelling properties, which help with the binding of other ingredients and the structural integrity of food products. But egg white proteins are, of course, most famous for their whipping or foaming properties which can help alleviate the often very dense and chewy structure of high protein bars," Kemper continues. "Especially in the cross-over category of protein-

enriched products, from sports to mainstream, we see a big opportunity for the use of egg white proteins to create healthy yet indulgent foods."

High protein content

Egg protein is an excellent protein source for muscle build-up. As the Eggcellent egg protein isolate (EPI90) has a protein content of above 90 percent and the egg protein concentrate (EPC80) varies between 80 percent and 90 percent, these ingredients provide a solid answer to the demand for nutritional bars.

"The main driver behind the introduction of the two new egg white proteins is the continuing market growth in sports nutrition and lifestyle foods coming from active and health-aware consumers. Combined with the general consumer trend for cleaner labels, using natural easy recognizable food ingredients, makes the lifestyle food market an interesting application area for Bouwhuis Enthovens' egg white proteins," Kemper further explains. Besides in nutritional bars, egg white proteins can be used in a variety of other sports or lifestyle products such as protein drinks, sweet and savory snack foods, bakery products and desserts, she says.

Extending shelf life & fine-tuning production processes

The egg white proteins from Bouwhuis Enthoven have shown to minimize or delay bar hardening, overcoming the first challenge by extending the shelf life of nutritional bars through careful tailoring of the egg white ingredients. Moreover, the ingredients do not cause off-flavors, because egg white proteins naturally have a very neutral taste.

By fine-tuning the production process of the egg white powders, Bouwhuis Enthoven was also able to overcome the challenge of improving the taste and functionality of its protein ingredients. The company influenced the characteristics of egg white proteins that are important for the optimal sensory quality of bars, such as protein structure, hydrophobicity, particle size, and water activity. Furthermore, EPI90 and EPC80 contain no fats or sugars that could otherwise participate in chemical reactions, such as lipid oxidation.

As a final advantage egg white proteins make it possible to create new and improved functional properties of the proteins that enable the creation of gels, mousses, and foams in layered bars. These properties can create bites ranging from chewy to crispy in baked or slab bars. Moreover, low-carb and high-protein versions of

traditional egg white-based confectionery products, such as nougat or meringue, offer opportunities for entirely new products that cannot be created with commonly used alternatives, such as whey or soy.

Most important for the shelf life optimization is that by fine-tuning the drying process of the egg white proteins, Bouwhuis Enthoven is able to create protein ingredients with varying physical properties important for optimal quality bars. "Depending on the formulation and process of the protein bars our technical support team supports food manufacturers with the selection of a suitable egg white protein ingredient," adds Kemper.

"In general the main cause of bar hardening is the migration of moisture. Protein type, water activity, hydrophobicity, particle size and density have been indicated as important properties of protein ingredients determining their functional behavior in nutritional bars. The globular structure and relatively high water activity of egg white proteins, as compared to other proteins commonly used in nutritional bars, are hypothesized to be the characteristics with a positive effect on the shelf life." she concludes.

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