CLEAN LABEL SOLUTIONS
FOR MEAT APPLICATIONS

Simplify your label by using potato starch and potato protein

Avebe

Introduction

While cost effectiveness is a continuous requirement to stay competitive in the meat industry, the need for a cleaner label is a growing trend. Consumers are very conscious of what they buy and what they eat.

*Some 28% of US consumers claim that 'clean label' is a factor that influences their purchasing decision when shopping for food or beverages across all categories (*Innova 2015)*

The growth in demand for so-called "free from" foods is significant and driven by a number of factors. Consumers are increasingly aware of the impact of food on health and of food-related allergies and intolerances. Hence they are more likely to read food labels and demand ingredient labels free from allergens, such as soy, egg or milk- derived ingredients.

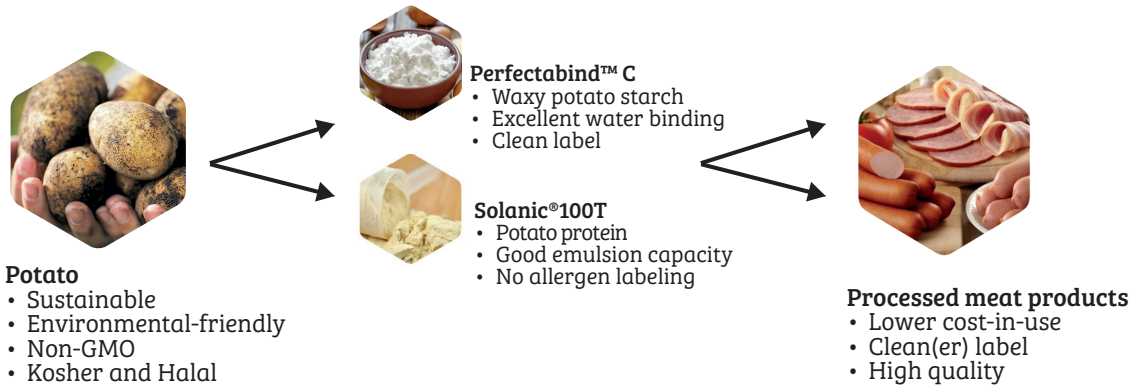
Food products with labels containing additives that are perceived as artificial, unnatural or not GMO-free, are no longer desirable. Examples again include soy-derived products, phosphates or certain hydrocolloids like carrageenan. As a result, the "free from" and "clean label" category in the supermarket is rapidly developing from a "niche" into mainstream - specialized manufacturers and large players are now investing significant amounts in launching those types of products. Avebe is dedicated to developing sustainable solutions for its customers, adapted to and meeting local market needs. This paper provides a solution to achieving cleaner label processed meat products.

Challenge for the meat industry

Many of the above-mentioned additives and ingredients are currently widely used in the meat industry. They help to maintain and improve water binding, texture and stability and they have proven to perform well in a wide range of meat applications for many years. Now that consumers have expressed their wish for cleaner labels, the challenge for the meat industry is how to achieve cleaner labels at an affordable price without compromising quality?

Clean label solutions

Based on our extensive ingredient knowledge and meat-application capabilities, we have managed to create a broad portfolio of potato-derived ingredients, specifically for the meat industry. This toolbox consists of specialty potato starches, proteins and fibers. Each ingredient has its own unique functional properties related to texture and stability. They have one thing in common – they are all 'clean label', meaning they are not chemically modified, they are non-GMO and free from allergen labelling. In addition, cost-in-use benefits can be achieved, while maintaining product quality and stability. We have added two new products to our comprehensive meat-portfolio - Perfectabind™ C special potato starch and Solanic®100T potato protein. Clear texture improvements can be obtained by using both ingredients together.



Special potato starch Perfectabind™ C

Our potato starches that were developed specifically for meat are based on so-called waxy potato starch, which produces a very high and stable water-binding capacity. In a model system comparable to processed meat, Perfectabind™ C outperforms various native and modified starches (see figure 1). In ham, sausages and canned meats that are based on high-quality meat, significant cost savings and texture improvements can be achieved. Perfectabind™ C is non-modified and non-GMO, and the need for carrageenan and/or phosphates can be made redundant, obtaining a cleaner label in the process.

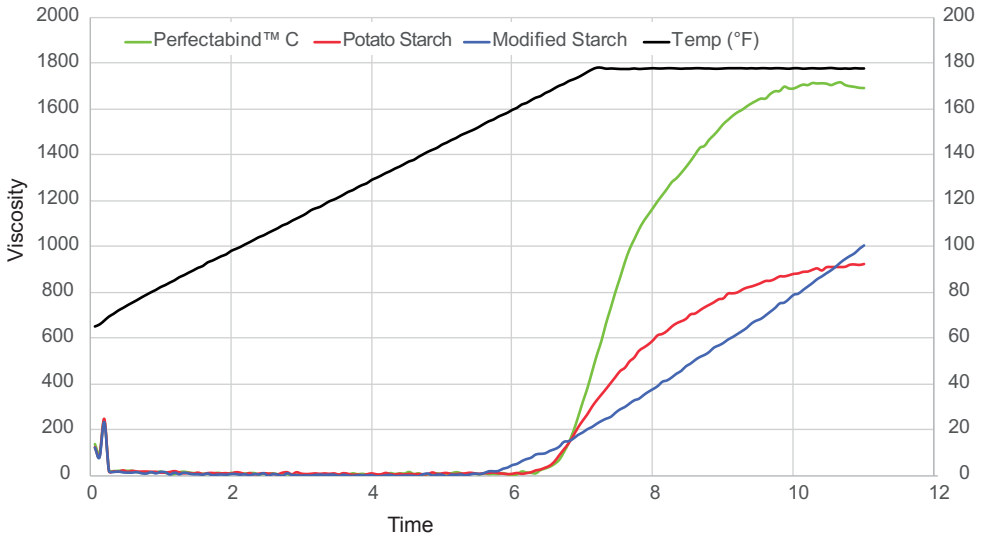


Fig 1. Viscosity development of 3 different starches in a meat matrix (2% salt) as a function of time and temperature.

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Potato protein Solanic®100T

As another solution to create a 'clean label' meat product, Avebe has developed a range of functional potato proteins with excellent emulsifying and gelation properties. At relatively low usage levels they can be used to prepare highly stable emulsions. Solanic®100T is a functional, partially soluble potato protein with an elevated pH of up to approx. 9, which helps to mobilize the meat proteins to bind more water. It is able to stabilize emulsions up to 1:15:15 (protein: fat: water ratio). It facilitates processing by contributing to a firmer meat dough, and supports the desired firmness of the final product. Solanic®100T is label-friendly - it does not need to be labeled as an allergen, unlike many other proteins such as those derived from egg, soy, milk and wheat. Finally, it enhances the protein content of the end application. Not only by the usage level, but also due to its excellent nutritional value which approximates that of animal proteins (PDCAAS = 1).

Clear texture improvements can be obtained by using both ingredients together. When Perfectabind™ C special potato starch and Solanic®100T potato protein are combined in a model system based on protein/fat/water, a significant effect on both firmness and elasticity can be observed (see figure 2). Perfectabind™ C is responsible for higher water binding, Solanic®100T for emulsifying the excess water. Together they make sure that the texture is improved and that texture and purge stability are maintained.

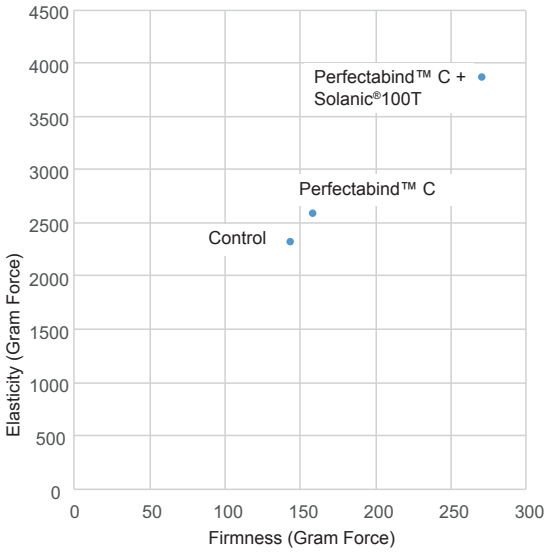

Fig 2. Effect on texture in a meat model system using Perfectabind™ C potato starch and Solanic®100T potato protein.

The test: Clean label beef hot dogs

Application research with beef hot dogs clearly confirmed the findings described above. The recipes that were used meet the FDA standards of identity (added water, binder rule). The first experiment was aimed at obtaining a cleaner label, without compromising quality. A control recipe is compared to a formulation without phosphate, erythorbate, nitrite and lactate/diacetate, but with Perfectabind™ C and Solanic®100T. The resulting yield of the clean label hot dog is higher than the control (92.8 vs. 91.3%), whereas the effect on texture is minimal with a slightly lower firmness and elasticity. Water binding and texture stability are known to be challenged in 'all natural' formulas, but in this trial a combination of Perfectabind™ C and Solanic®100T made it possible to reduce the role of undesired additives.

The second experiment was aimed at realizing cost-in-use benefits. It compares a control recipe to a lower cost recipe with Perfectabind™ C and Solanic®100T. The control recipe has more lean meat and less water. The fat content of both formulas is equal. The resulting yield of both hot dogs is comparable, and even slightly higher for the lower cost formula. Furthermore, the texture (hardness, gumminess, chewiness) of the lower-cost hot dog is very close to the control. However, the benefit of using a combination of Perfectabind™ C and Solanic®100T is in the cost-in-use - corrected for the yield, cost savings of up to 7% are achieved compared to the control (see table 1)!

Beef hot dogs (standard of identity)	**Control**	**Low cost (with potato starch and potato protein)**
Raw material costs ($/lbs)	0.62	0.58
Cooked yield (%)	91.3	91.9
Yielded raw material costs ($/lbs)	0.68	0.63
Cost savings vs control ($/lbs)		0.05
Cost savings vs control (%)		**7.0**

Table 1. Cost savings obtained in beef hot dogs by using Perfectabind™ C potato starch and Solanic®100T potato protein.

More application studies were done, in both US-style and European-style meat products, such as beef patties, pork frankfurters and liver paté. Results and recipes are available on request.

Benefits for processed-meat manufacturers

In many more meat applications the use of potato starch and potato protein offers a unique opportunity to realize cost-effective, clean or cleaner label solutions, while maintaining or even improving quality.
In summary, a combination of Perfectabind™ C special potato starch and Solanic®100T potato protein delivers:

- A clean or cleaner label: non-GMO, free from allergen labeling, fewer artificial additives
- Cost savings of up to 7% in beef hot dogs without compromising quality
- High water binding and great emulsification
- Improvements in texture (firmness, elasticity) and texture stability can be achieved

Contact us

Contact Avebe for detailed cost calculations, recipes and/or processes, or any other questions you may have. Many recipes and production processes of local product varieties are available to you. Contact us directly at info@avebe.com or find your local sales contact here:www.avebe.com/contacts.

About Avebe

Avebe is a cooperation of 2,500 growers of starch potatoes in the Netherlands and Germany. Each year, the starch potatoes of the members are processed into high-grade ingredients based on potato starch and potato protein; they add value to food products worldwide. Avebe works continuously on developing new opportunities and applications based on starch potatoes and is focused on sustainable continuity. The company has over 1,300 employees and production sites in the Netherlands, Germany and Sweden and sales offices in the USA, Europe, Asia and the Middle East. The Head Office is located in Veendam, the Netherlands. Avebe is a trade name of Coöperatie AVEBE U.A., with its registered office in Veendam (Chamber of Commerce No: 0230084).

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