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PROCESS

MALTODEXTRINS VS NATURAL FIBERS

WHITE PAPER RESEARCH

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A Call for Cleaner Transparent Labels

When most consumers consider adding a dietary supplement to their health and wellness routine they naturally focus on the active ingredients and how they impact their health. Many consumers are so focused on the active ingredients, they do not want anything else in their supplements. They are asking what else is in there and are demanding cleaner, more transparent labels. In fact, 66% of consumers consistently indicate that transparency influences their dietary supplement purchase decisions. Furthermore, they expect the same from their supplement labels as they do from their food labels. While there is no agreed upon definition of a “clean label”, consumers are looking for a dietary supplement with simple ingredient names, minimal use of excipients and other non-active compounds, use of natural ingredients, free from genetically modified ingredients (GMOS), allergens, synthetic components. In short, nothing artificial or unnecessary. They question ingredients listed on the label under “other ingredients” with very little information as to how much is in there, what they do or what exactly they are derived from. These “other ingredients” are referred to as excipients or fillers and are used for various technological functions such as anti-caking, binding ingredients, simply filling the capsule etc. While most are considered safe, some are better than others and it’s important for companies to be transparent and to help the modern consumer to make informed choices regarding every ingredient in the capsules they are taking, not just the active ones.

What is commonly used as filler in supplements?

Maltodextrins (MDs) are one of the most common fillers and binder. MDs are a class of carbohydrates (CHOs) typically derived from corn but can potentially come from a range of sources. They are produced for use as thickeners, fillers and excipients in the food and pharmaceutical industries through enzymatic or acid hydrolysis of the starch, followed by purification and spray drying resulting in a white powder (Takeiti et al., 2010). This white powder is then used in foods, beverages and capsules for dietary supplements, prescription drugs and more. While MDs have been used for many years and have been considered safe for human and animal consumption by the regulatory agencies of most countries, there has been concern about their cumulative impact on human health (Lê et al., 2016). One concern is reflective of the increased awareness of the negative health implications of an excessive consumption of refined carbohydrates on global obesity rates, as well as obesity related diseases. In addition to contributing to the increasing obesity rates, the rise in consumption of refined CHO sources has been linked to an increased risk of several health concerns. For example, animal models have demonstrated that regular exposure to MDs causes disruption in gut balance and can lead to increases in GI issues and to inflammation throughout the body (Laudisi et al., 2019). While it may seem like the amount of MD in a capsule is not enough to impact health, if one considers all the potential foods, beverages and other supplements that may contain MD, all together it adds up. Furthermore, consumer awareness of MDs on a label and the negative association can’t be underestimated. There is concern that MD might be derived from bioengineered (also referred to as genetically modified organism or GMO) corn. There is growing concern that GMOs are bad for people consuming them as well as the environment. One reason for the concern is that many GMO crops are said to require more pesticides and herbicides. Though there is limited research to support the concern, public perception is driving the need for alternatives to MDs.

Alternative Sustainable Excipients for a “Clean Label”

Because of the potential health implications and negative public perception, alternatives have been developed. One such alternative is pea hull fiber which is greater than 55% fiber. Following the trend for the re-utilization of various agro-industrial byproducts, pea hull fiber is a dry-milled from the seed coats or hulls of dried peas. Pea hulls have an 85% fiber content and has a 75-25 balance of insoluble to soluble fiber and contains numerous micronutrients including calcium, iron, magnesium, potassium, vitamins B1, B2, B3, B6 and folic acid. It has been used as a thickener, stabilizer, gelling agent and for texture. Not only does it support sustainability, but it is also a healthier, organic (and therefore GMO free), allergen free, gluten free alternative to MD that is high in fiber and nutrient dense (Cheng et al., 2018). An increased demand for vegetable-based proteins and alternative fiber sources has created a need and opportunity to fully utilize side stream products. Since pea is one of the key sources of many vegetable-based proteins, utilization of its side stream products, such as pea hull, reduces waste and enhances sustainability, which is a driving force behind consumers' interest in such products.

In addition, oat hull fiber is a viable alternative. The oat fiber is greater than 95% fiber and is composed of insoluble fiber from the oat hull or outermost protective seed-coat of the oat kernel, which is a rich source of fiber. The hull is one of the byproducts of the milling process for the fiber rich, GMO-free oat flour. Using the oat hull, supports a 99% landfill diversion rate. This means more of the oats are being used and less is being put into the landfills as waste. We support companies that manufacture with these goals in mind and are therefore committed to sustainability.

The use of the organic oat hull fiber and pea hull fiber minimizes the potential for presence of any pesticides, herbicides, or heavy metals in the finished product. This also provides for a “clean label” as the final product consists only of these fibers and the herbal material used for the processing. The organic oat and pea hull fibers are non-GMO, allergen free, gluten free, glyphosate free, and contain no sugars, no refined carbohydrate materials, or any artificial ingredients of any kind.

These fiber-based materials also support the digestive process since insoluble fibers are an important part of the human diet. The oat and pea hull fibers contain both digestible and non-digestible fiber, with non-digestible fiber being the primary component.

These fiber-based cannabinoid infused powders pass through the stomach and are primarily digested in the small and large intestine where they are slowly absorbed. This preferred format is intended to result in a slower onset and longer lasting effect as compared to tinctures and gummy bear cannabinoid products. Intake of oil-based tinctures and gummy bear products results in a rapid uptake of the cannabinoid into the bloodstream which diminishes over time (Izgelov et al., 2020).

The micronized cannabinoid infused powders are intended to lead to a slower onset and rise more slowly to levels that are maintained for a longer period. This makes the powder an ideal choice for a more sustained release product.

Do the pea and oat hull fibers meet ideal manufacturing requirements?

Examination of the benefits of processing with these materials indicates that they meet all of the objectives of a nutritional powder product with respect to handling and manufacturability. The particle size distribution, low stickiness, low static charge, and high flow rate allow for the material to be easily incorporated into any typical dry powder formulation designed for encapsulation processing.

These powders and their resultant mixtures have successfully been run on semi-automatic and high speed automatic hard shell encapsulation equipment at rates up to 100,000 capsules/hr that meet all finished capsule QA requirements.

Conclusions:

- Consumers want cleaner label products and will deep dive into all ingredients on the label
- Pea and oat hull fiber support cleaner label initiatives, perform as well as maltodextrin and offer health/functional advantages over other excipients
- Fiber-based cannabinoid infused powders are capable of adjusting ingredient uptake and absorption, an advantage in formulating slower onset and longer lasting effects
- These products are versatile, easy to formulate with and are easy to incorporate into a broad range of product formats including capsules

To summarize, pea hull and oat hull meets the perception of a clean, transparent, sustainable product that resonates with consumers and should be a key consideration for differentiated brands and retailers.

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