

## Questions and Answers

### 1) What are the formula blends of medicinal mushrooms made from?

#### **Immune Health Blend - NEW**

One hybrid strain from the *Coriolus versicolor* specie  
Three hybrid strains from the *Ganoderma lucidum* specie  
One hybrid strain from the *Agaricus subrufescent* specie  
One hybrid strain from the *Hericium erinaceus* specie  
One hybrid strain from the *Cordyceps militaris* specie  
One hybrid strain from the *Ophiocordyceps sinensis* specie

#### **Neural & Cognitive Health Blend**

One hybrid strain from the *Hericium erinaceus* species  
One hybrid strain from the *Cordyceps militaris* species  
One hybrid strain from the *Ophiocordyceps sinensis* species  
Three hybrid strains from the *Ganoderma lucidum* species

#### **Blood Sugar Health Blend**

One hybrid strain from the *Grinfola* species  
Three hybrid strains from the *Ganoderma lucidum* species  
One hybrid strain from the *Cordyceps militaris* species  
One hybrid strain from the *Ophiocordyceps sinensis* species

#### **Liver Health Blend - NEW**

One hybrid strain from the *Antrodia camphoratas* species  
One hybrid strain from the *Agaricus subrufescent* specie  
One hybrid strain from the *Coriolus versicolor* specie  
Three hybrid strains from the *Ganoderma lucidum* specie  
One hybrid strain from the *Hericium erinaceus* specie  
One hybrid strain from the *Cordyceps militaris* specie  
One hybrid strain from the *Ophiocordyceps sinensis* specie

2) **What is the shelf life of the products?**

Indefinite. We have used product which had been stored for seven years and it provided the same beneficial health benefits. We state that the products are best used within 3 years; however, if kept dry and stored at room temperature (not frozen) the products retains quality. You can refrigerate but do not freeze the products.

3) **Where are the mushrooms grown?** They are grown in laboratories in the USA.

4) **What is the food for the mushrooms?** Organic, sterile fruits and vegetables.

5) **How long does it take to grow the mushrooms?** Each mushroom strain takes a different period of time to grow, the longest being 63 days.

6) **Are there any side effects?** There may be sensitivity to the touch to those parts of the body that had diseased cells or tumors for a few days or weeks. This is caused by the immune system attacking and consuming tumor or diseased cells. In some cases, if the person is very toxic, there can be diarrhea or night sweats for up to three days. This is a sign that you may be detoxing.

7) **If the person is allergic to penicillin or antibiotics is it safe and will there be any side effect?** None at all.

8) **Do you ship internationally?** Yes.

9) **How long do I have to wait for my order?** In most cases we can ship the same day if the order is received by 2 pm Pacific Time. If we do run out, you may have a 2 to 3-week delay because of the growing cycles of the various strains of mushrooms.

10) **How do we consume the products?** You can add them to a food or beverage. Review the literature provided. We are posting recipes on our web sites and newsletters.

11) **Where do we find out more about the science on mushrooms' strains?** Go to the web sites [quanthealth.org](http://quanthealth.org), documents provided and [foodabout.org](http://foodabout.org)

12) **What are the mechanisms and pathways of the known beneficial chemistry in the mushroom strains used?** Go the [quanthealth.org](http://quanthealth.org) and [mycoldiscoveryseminar.com](http://mycoldiscoveryseminar.com) web sites for more information.

13) **What is the dosage to consume?** It varies for each person and depends on the severity of the illness or disease. When the product has been consumed anecdotal observations showed that it supports the immune and nervous systems when people consumed between 8 to 12 teaspoons (16 to 32 grams) or more a day. Cut the dosage in half for children under 12. See the dosage observation chart. A health care professional should advise on this.

14) **What does the company do?** The Company grows and sells medicinal mushroom blends composed of proprietary hybrid strains of medicinal mushroom species. The strains used are not commercially available from other growers for national and international distribution. The products are produced as foods for integrative health care as evidence-based, complementary support for human chemistry. The mushrooms are grown in sterile, clean room facilities with no soil and are grown on certified organic substrates. Once grown, the medicinal mushrooms are dried and processed into a powdered form in a sterile environment. The blending and packaged is done in a sterile environment.

15) **How are the products packaged?** Packaging in done in sterile clean rooms for each product and products come in three weights: 1.3 pounds/20.8 ounces (590 grams)

container, .65 pound/10.4 ounces (295 grams) container, and a .43 pound/6.9 ounces (196 grams) container.

- 16) **What makes your product different or unique?** Currently, few manufacturers or distributors sell quality fungi extensively to health care professionals, hospitals and medical food services and: (1) none have our hybrid strains (2) none have our quality and safety standards (3) few use our organic substrates to grow mushroom strains on (4) none use sterile clean rooms for the growing, processing and the packaging (5) none have a shelf life of four years or more.

The company's formulas and products therefore have no direct competition because of the proprietary strains, proprietary formulas, beneficial chemistry, substrates used, and the quality standards for the growing and harvesting of the hybrid mushroom strains. Most medicinal mushroom products are extracts made from mushrooms of unknown origins and grown on unknown soil or other substrates. Soil and non-sterile substrates used in some competitor's production increase the risk of contamination, the incorporation of heavy metals and toxins, and higher product variability.

- 17) **Are the products safe for pets?** Yes, they are totally safe for pets. We have had dogs, cats and horses use it with positive outcomes.
- 18) **Will cooking the products negatively affect the benefits?** Very little unless you burn them.
- 19) **How are the mushrooms grown and processed?** The products are grown in clean room sterile laboratories on autoclaved substrates, air dried in sterile clean room environments and then blended according to the formulas and packed for consumer use in sterile clean rooms.
- 20) **Can this product be used topically?** Yes it can, add to hand cream or aloe, mix together and then apply to the skin and rub it in.
- 21) **Does any of the mushrooms have toxicity?** No there is no level of toxicity found, it is safe for pregnant women and for children.
- 22) **What is the history of use of specific mushrooms in support of health?**  
Mushrooms are the fruiting body of heterotrophic macrofungi which have long been used for both food and medicine. Mushrooms have been studied extensively for improving and maintaining human health and show promise as a source of prebiotics. Mushrooms are rich in prebiotic compounds as they contain carbohydrates like chitin, hemicelluloses, beta and alpha glucans, mannans, xylans, lingo-cellulose, and galactans. Polysaccharides such as  $\beta$ -(1 → 3)-D-glucans are well-known prebiotics and the most potent mushroom derived substance. Such polysaccharides and their complexes with protein/peptides are known to be modifiers of biological responses. They contribute significantly to the body's defense systems by exhibiting immunomodulatory and antitumor activities through the action of immune effector cells such as dendritic cells (DCs), hematopoietic stem cells, lymphocytes, macrophages, natural killer (NK) cells and T cells. Additionally, other medicinal properties of mushrooms include antioxidant, anticancer, anti-inflammatory, cardiovascular, antimicrobial, and antidiabetic characteristics.

## References

Vasconcelos IM, Oliveira JT. *Antinutritional properties of plant lectins*. *Toxicon*. 2004 Sep 15;44(4):385-403. <http://www.ncbi.nlm.nih.gov/pubmed/15302522>

Dr. Solomon P. Wasser, "Medicinal Mushroom Science: Current Perspectives, Advances, Evidences, and Challenges" Institute of Evolution and Department of Evolutionary and Environmental Biology, Faculty of Natural Sciences, University of Haifa, Israel. Jul. 17, 2014: 346-356.

23) **Are there Lectins in mushrooms?** Yes, there are but of different structures that are not harmful with the synergistic chemistry. The word "lectin" is often misused within the Paleo community. You'll hear phrases like "grains are bad because they're full of lectins". While this is basically true, not all lectins are bad.

Lectins are a large class of carbohydrate-binding proteins found in all forms of life, including the human body. Many types of receptors embedded in the cells in our bodies are lectins. A group of proteins essential to our innate immune systems, called complement proteins (because they "complement" the activities of inflammatory cells by providing a rudimentary targeting mechanism for this otherwise non-specific part of the immune system), are lectins. This is why labeling a food as "full of lectins" is inaccurate and the type of phrase that opens up the Paleo diet to (valid) criticism.

Lectins are proteins that possess at least one noncatalytic domain that allows them to selectively recognize and reversibly bind specifically free sugars (monosaccharides) or oligosaccharides, present in the cell without altering the structure of carbohydrate which make possible their use as decoders of cellular carbohydrates. They have a largest distribution in nature in all kingdoms of life with a higher distribution in plants and also in animals and microorganisms. The plant lectins represent a unique group of proteins with potent biological activity, where legumes lectins represent the largest thoroughly studied family.

Based on their mechanism of action, the plant lectins can exert action in diverse biological process as plant protection and in medicine as lectin-based delivery systems, biomedical research, as diagnostic and in disease treatment. In animal cells lectins can have action in various of biological process included the cellular adhesion, invasion, metastasis inhibition, action on angiogenesis and in cellular death by autophagy, necrose, and or apoptosis. The best-known legume lectins are phytohemagglutinin from red kidney beans (*Phaseolus vulgaris* L.), soybean agglutinin from *Glycine* max, concanavalin A from jack bean (*Canavalia ensiformis*), peanut lectin from *Arachis hypogaea*, and pea lectin from *Pisum sativum*. Others important plant lectins with recognized antitumor activity (where ConA is included) are *Ulex europaeus* agglutinin, *Viscum album coloratum* agglutinin, mistletoe lectin, and *Viscum album* agglutinin from *Viscum album* L. and *Galanthus nivalis* agglutinin, among others. This review aims to give the state of art of lectins as potential candidates for the development of more efficient anticancer or cancer preventive drugs.

In plants, the roles of lectins are still being identified, although they appear to be part of the plants' natural defense mechanisms and to be important for seed survival (why lectins tend to be concentrated in the seeds of plants).

Not all lectins are bad, but some are (or at least, can be). A subset of lectins that can be found in large concentrations in the seeds of grasses (i.e. grains) and the legume family do have some properties that can make them very problematic for human health, namely that:

- ❖ they are hard to digest (this has the effect that they can overfeed certain species of gut bacteria and lead to gut dysbiosis, which now linked to a variety of health conditions),

- ❖ they can interact with the gut barrier and actually damage the cells that form the gut barrier or open up the junctions between those cells (genetic susceptibility plays a role in what extent this happens in your body), contributing to development of a leaky gut (now linked to a variety of health conditions), and
- ❖ they can stimulate the immune system (proportional to how much enters the body and type of lectin).

There are really just two classes of lectins that are known to be problematic for human health and have the above properties. The first are called prolamins (gluten is an example of a prolamins), so called because of their rich proline (an amino acid) content. The second are called agglutinins (wheat germs agglutinin, kidney bean lectin, and soy lectin are examples of agglutinins), so called because of their strong ability to agglutinate (or make clump together) red blood cells (they also happen to be rich in proline).

Phytohemagglutinin, also known as kidney bean lectin. Both prolamins and agglutinins (there are many proteins within each class) affect the type of bacteria that like to grow in your gut (in a negative way, typically preferentially overfeeding certain strains like *E. coli*). They are also very good at crossing the gut barrier and there are actually four known mechanisms through which prolamins can enter the body (one of which is dependent on genetic susceptibility and it remains unknown if the other three occur in everyone or vary from person to person) and three known mechanisms through which agglutinins can enter the body (which appear to be independent of genetics, although more studies are required). Not all of these entry pathways damage the gut barrier, but some can (again, genetic susceptibility may play a role, but more research is needed). By the way, I should mention that the exact mechanisms of how these proteins enter the body and potentially damage the gut barrier are discussed in detail in *The Paleo Approach* (in a way that anyone can understand with illustrations, so don't let that intimidate you either!). Once these proteins enter the body, they interact strongly with the immune system (typically stimulating inflammation, but the adaptive immune system can also be affected). The distinction between prolamins, agglutinins and lectins in general is why you'll see more and more people within the Paleo community using the term "toxic lectin" or being even more specific and using the terms prolamins and agglutinin. However, even within these two classes, some prolamins and agglutinins are more damaging than others.

For example, the agglutinins in many types of legumes can be reduced by soaking, sprouting and fermenting and largely deactivated by heat, especially during prolonged cooking. And the concentration of agglutinins in different types of legumes varies dramatically. In fact, legumes with edible pods like green beans, sugar snap peas and snow peas are generally endorsed on a Paleo diet because the concentration of agglutinins is low and the instability of the agglutinins in these legumes means they are typically rendered inactive by cooking. In other types of legumes (soy and peanuts being the biggest culprits, but also some types of dried beans like kidney beans), the agglutinins are very resistant to deactivation and degradation. Wheat germ agglutinin is so resistant to deactivation through even traditional food preparation methods, that even consumed as part of your food, it qualifies as a biologically active compound in our digestive tracts (that would not be a normal classification for a protein in food!).

There are no comprehensive studies that measure the amount or the different types of prolamins and agglutinins in different grains and legumes or their stability with different food preparation methods. Until these details are better understood, the Paleo diet omits all grains and all legumes (with the exception of those with edible pods as already mentioned) due to the

potentially detrimental effects of prolamins and agglutinins on human health. It also doesn't help that these are high glycemic load foods, with incomplete protein that is harder to digest than animal protein, and with lower vitamin, mineral and antioxidant density than fruit and vegetables (which is what a Paleo diet endorses consuming instead of grains and legumes).

## References

Vasconcelos IM, Oliveira JT. *Antinutritional properties of plant lectins*. *Toxicol*. 2004 Sep 15;44(4):385-403. <http://www.ncbi.nlm.nih.gov/pubmed/15302522>

Ana CristinaRibeiro\*<sup>†</sup> RicardoFerreira<sup>†</sup> ReginaFreitas<sup>†</sup>

*"Plant Lectins: Bioactivities and Bioapplications"*

Faculty of Pharmacy, DCTB, Universidade de Lisboa, Lisbon, Portugal

Higher Institute of Agronomy, DRAT, Universidade de Lisboa, Lisbon, Portugal

## 24) Issues Relevant to Commercial Production

Cultivating medicinal mushroom strains at large scales requires methods to provide consistent, safe, effective and reliable products. The current production methods and standards in the market need upgrading before they can achieve these results. We have the systems, controls and processes to assure the products are safe and are of the best quality and standards in the world. Product quality can also be impacted by the fact that many manufacturers and resellers rely on several sources of mushrooms, and some are of dubious origins. These different sources often show considerable variation with respect to substrates used and manufacturing practices. Unfortunately, the perceived future growth of this sector has also resulted in an ever-increasing number of less-reputable companies, and their questionable practices will inevitably lead to more intensive scrutiny of the sector as a whole. There is urgency for the medicinal mushroom manufacturing industries to develop and adopt acceptable and reproducible protocols for growing the raw product and for the processing of the final products. Enforcing these standards will ensure high-quality, standardized, and safe products. Such practices are essential for earning and maintaining the public trust, which is vital for securing expanding markets in the future.

All of these statements have not been evaluated by the FDA. These products are not intended to diagnose, treat, cure or prevent disease. This information is not a substitute for professional medical advice, diagnosis or treatment and should not be relied on to make decisions about your health. Never ignore professional medical advice in seeking treatment because of something you have read on this Site.