

# AGARICUS BLAZEI "mushroom of life"

## Section One (pp. 2-9) Interview with DR. DARIA DAVIDSON on Agarigold with H1X1 2008 March 18

What makes AgariGold™ with H1X1 so good for your body?

Well, it contains life-enhancing nutrients essential for your health.

Here's a glimpse of some of the 100+ powerful nutrients found in AgariGold.

### Amino Acids

The basis of life. They are the building blocks needed to create cells, hormones and enzymes.

Arginine  
Lysine\*  
Histadine  
Phenylalanine\*  
Tyrosine  
Leucine\*  
Isoleucine\*  
Methionine\*  
Valine\*  
Alanine  
Glycine  
Proline  
Glutamic acid  
Serine  
Threonine\*  
Aspartic acid  
Tryptophan\*  
Cystine

\*(includes the 8 essential amino acids)

### Minerals

Central in helping the body produce energy, growth, and the reproduction and health of our cells.

Sodium  
Phosphorus  
Iron  
Selenium  
Calcium  
Potassium  
Magnesium  
Carbonate (as CO<sub>2</sub>)  
Phosphoric acid (as P<sub>2</sub>O<sub>5</sub>)  
Copper  
Zinc  
Manganese  
Silicic acid (as SiO<sub>2</sub>)

### Vitamins

Substances that your body needs so that it can work properly.

Thiamine (B1)  
Riboflavin (B2)  
Niacin (B3)  
Pantothenic acid (B5)  
Pyridoxine (B6)  
Vitamin D  
Biotin  
Inositol  
Choline



### Enzymes

Substances which make life possible. They are needed for every chemical reaction that occurs in our body. Without enzymes, no activity at all would take place. Neither vitamins, minerals, or hormones can do any work—without enzymes.

Peroxidase	Ligninase	Adenylcyclase	Inulase
Esterase	Emulsin	Allinase	Raffinase
Lecithinase	Trypsin	Luciferase	Rennin
Tannase	Decarboxylase	Pachymanase	Pepsin
Pectase	Phenolase	Rehenase	Asparaginase
Saccharase	Laccase	Catalase	Erepsin
Invertase	Sucrase	Enterokinase	Oxidase
Maltase	Dehydrogenase	Fumarase	Arabinose
Trehalase	Pectinase	Tyrosinase	Xylose
Cellulase	Peroxidase	Zymase	Ribose
Glutamine	Urease	Hemicellulase	Rhamnose
Lactase	Lipase	Cytase	Galactose
Mannanase	Oxidase	Pentasanase	Lignin

**DR. DARIA DAVIDSON** Has an extensive background and experience with the Agaricus Blazei mushroom with H1X1, now known as the **Agarigold with H1X1**. She also has been using in her practice the NCD (the Natural Cellular Defense) as well – she has had quite an experience with that. She is not a distributor; she is not affiliated from a financial standpoint with Waiora or with any of our products, but it is due to her passion about helping people and her belief in these products, and that’s why she is sharing her time with us this evening to help us learn a little bit more about this product.

### **Dr. Davidson - My Background**

I do have a lot of experience with this particular product, and as for my background, I have been in health care for over 30 years. I was a pediatric intensive care nurse, but I became a physician and my original specialty was in Emergency Medicine – I am Board-certified in that specialty – and I worked in the Emergency Room for 20 years. During that period of time I treated over 70,000 patients. I spent 11 years running a level-one trauma center (like the TV series, ER), very chaotic.

In 1992 I was diagnosed with breast cancer. It was extremely aggressive and they told me I would never hear the word “cure.” My mother and dad had been afflicted and my grandmother as well, and I was told that the younger you are when you get a breast cancer diagnosis, the more ominous it is, and I was 41 and under a great deal of stress with my work. Over the years we make decisions, and we hope that we make right ones, especially when you have been diagnosed with cancer. People often ask, “Well, what cured it?” and I have to say I don’t know. I have done a lot of things.

I got interested in nutritionals and many other areas of health and medicine starting in about 1995, and also became Board-certified in Holistic Medicine as well as Allopathic and Emergency Medicine, so my medical classes contain a very specialized area of holistics, and in those classes I do often deal with people who are dealing with serious diagnoses, frequently at the terminal level, so I do have experience in working with many different things.

### **About Mushrooms**

We’ve heard of medicinal mushrooms – they’ve been used from 3,000 to 5,000 years in traditional Chinese medicine, and there is a lot of good data that shows they are incredibly beneficial for an array of healthy concerns geared to keeping you healthier. Traditional mushrooms have been designated for many things, and after looking at many of them, I found there was a problem (and this is basic for all mushrooms), mushrooms are not plants. The reality is that plants take in carbon dioxide and give off oxygen – we take in oxygen and give off carbon dioxide. They are very, very porous to toxins in their environment, so wherever a mushroom grows, it’s going to have a concentration of heavy metals and arsenic – things like that. So when you are looking at mushrooms there are two issues—potency and purity.

### **Discovering Agaricus Blazei**

An interesting thing happened in about 1960. There were some Japanese researchers in an area of Sao Palo in the region of Brazil, a small little village called Piedade, and the people living there were extremely healthy. They lived to be quite old, and they didn’t have anything like cancer or arthritis or diabetes or heart disease or Alzheimer’s. The Japanese researchers began to wonder what was going on with these people, and they thought it could be genetic, but they also noticed that they were eating

mushrooms in their environment on a daily basis. The researchers got to thinking there must be something in the mushrooms that came from Japan, where medicinal mushrooms are commonly used. After working with this particular strain of mushrooms, called **Agaricus Blazei**, from this area of Brazil, they took it back to Japan. Agaricus is not a native Chinese or oriental mushroom at all. It is related to South America, particularly this area of Brazil. When they brought it back to Japan they cultivated some, and then they started comparing it to the other traditional Chinese medicinal mushrooms. There were four of the big ones that they actually compared them to, and they did a study that changed forever the interest in mushrooms in Japan.

They had some laboratory animals and they gave them a particular cancer-agent, from which they all got cancer and were typically dead within five weeks. In the interim they started giving them the different medicinal mushrooms with each one isolate (including this new one from South America, Agaricus). They found that the Agaricus was more powerful than all the rest – 90% of the time the animals with cancer had complete eradication of all tumors and all cancer, which was higher than anything else. Some people ask about Reishi mushroom, and it actually came out the lowest. It was only about 20% of complete eradication of cancer.

### **Agaricus Blazei as Possible Cure and Prevention**

They also looked at the Agaricus in a **prevention mode**. They gave it before the exposure to the toxin to see if it would prevent cancer, and it did prevent cancer 99% of the time in these animal studies. So this got a lot of attention. Everybody in Japan started getting very excited about it and Agaricus became a very popular mushroom over there – actually, the most popular. There was a study reported from the government of Japan that showed that over 59½ % of all people in hospice care actually used the Agaricus mushroom product, so where it is new for us, **it is not new for Japan**.

As I said earlier, the problem with mushrooms is you cannot assume that just because you are buying them, they are not toxic. Actually, there has been some deaths associated with consumption of Agaricus mushroom supplement, and that they found that they were contaminated with heavy metals from calves' liver consumption, and they died with liver disease. So there is definitely the purity issue.

Here is what happened: We have the Agaricus which we now know is stronger than all the other medicinal mushrooms in traditional Chinese medicine, but how do you get it pure? How do you get it potent enough? These are the big issues. The Japanese individuals in love with Agaricus started looking for a way to see if they could isolate a very, very potent strain. They contacted some mycologists who specialize in mushrooms here in the United States and asked them if they would mind trying to isolate a very potent strain of Agaricus.

Many of us don't think we would like to eat mushrooms, but you don't have to eat the mushroom at all – you just take a few drops and it has phenomenal benefits. **Agaricus is a super food**. It contains 10 different amino acids; it has a bunch of vitamins and minerals, 46 enzymes, a precursor of vitamin D (and I think you have been hearing a lot about vitamin D's benefits in our bodies as far as keeping our bones healthy). Agaricus is very rich in 1-3, 1-6 Beta Glucan, which is the most potent anti-tumor natural thing that has ever been found. So Agaricus is very rich in general.

## **Efforts to Ensure Purity and Potency**

It happens that the mycologists here in the United States started gathering up every possible strain of Agaricus mushroom that they could find. They had friends and colleagues looking all over the place sending samples to them. They started doing some cross-matching; they started doing some different modulations to the pedigreed one, and they just keep testing hundreds and hundreds of different species and populations, and they came upon a combination that was the original pedigree from Sao Palo, Brazil, combined with what was going to be a raspberry field in California, and that combination was amazing and they put together an incredibly potent offspring from it, many times higher than anything they had ever found. It was clearly in a class of its own.

That one is happened to be called H1X1 (just a laboratory designation) so **Agaricus H1X1 became the brand new hybrid of the Agaricus population.** This is very, very, potent and the mycologists decided to isolate two samples of it. One was kept in a vault in the United States and one was kept in a vault in Europe, just in case something ever happened. It was kept in a very rigid temperature and humidity control so they would have a pure population whenever they needed to grow a crop.

When they want to do that, they take it out of the vault and **genetically fingerprint it.** I actually visited the place where these mycologists are because I am really fussy about what I recommend in my classes. I was a little nervous about mushrooms because they are such funny characters, so I went and visited there and I saw how they genetically fingerprinted it; I saw where the vaults were and even how they grow the mushrooms. They genetically fingerprint it every single time to make sure that nothing has changed, that each one is the exact strain that they had identified when they first put these two individual populations together. Once they have done that, they grow organically in a controlled environment. They have underground caves, and in visiting them, they smell like a surgical lab—there wasn't a bit of dust anywhere, it was quite amazing. They are grown organically and they are tested every time for potency so they know for sure it is very, very high.

## **USDA Certified Organic Agaricus Mushroom**

So we have a USDA certified-organic Agaricus mushroom which certainly answers the question for purity, and then the potency of the H1X1 is very, very high. They isolate it; they keep it in the vault; they medically fingerprint it; they grow it organically.

Then, once they have done that, in order to get the extract out of the mushroom, they have a process that pulls it out. Typically, it's a three-stage process that pulls out nutrients, but sometimes the nutrients are damaged in the process, so you don't get a full extraction. They were able to identify it through a 10-phase process of pulling out the nutrients and they found when they took the H1X1 and extracted it with the normal three-phase process versus the 10-phase process, that it pulled out just as much protein, 10 times as much essential fatty acid, and 16 times as much 1-3, 1-6 Beta Glucan, so it was huge!

## **3,000 Times Higher than Other Agaricus!**

The potency was then able to be extracted as well with the 10-phase process and after they did that, they compared it to one of the most popular Agaricus supplements in Japan to see if it was truly higher – and it was 3,000 times higher! So having learned all of this, do I feel confident that this is pure?

Absolutely! Do I feel confident it is potent? Absolutely! I use it therapeutically in my practice where most of the people have very, very serious diseases, but the reality is it helps a lot of things in your body and if you look at the list of things it can do, it also helps modulate the immune function and helps people who have some autoimmune issues. I have used it many times with patients who have that, and I have not seen a problem at all.

### **Only Doctors can Prescribe**

I am a doctor so I get to prescribe things. If you are a doctor, you get to prescribe things, too. But as representatives of a company you don't ever prescribe anything. When I talk about what I might do in my practice, please understand – I have a doctor/patient relationship with those individuals, and that is not something that you have, unless you are a doctor or have a doctor/patient relationship with someone.

### **Some Important Capabilities**

This is a product designed to support immune health, to support proper blood sugar levels, to support healthy heart function, healthy liver and cholesterol function. It has a wonderful effect in helping keep viruses and bacteria exposure managed by your body, and it's very wonderful for energy and stamina. It supports all of those things. I know that the mushroom has incredible capabilities.

### **Agaricus H1X1 is Patented!**

The mycologists were able to get a patent on the H1X1, which is unheard of – you just can't patent nature – but they were able to share with us that this population had no likelihood of ever coming together with the one in South America and the one in the raspberry field in Northern California, so through all of their efforts and thousands of passes in medical mushroom populations, they were able to document a great deal of assays and they were indeed **given a USDA patent**, which is phenomenal!

### **Sasa Bamboo as Natural Preservative**

The extraction process also has a patent, which is only used for H1X1, and no other mushroom has access to that process. It's really quite amazing. Secondly, they wanted to figure out some way to have a natural preservative for the mushroom and try to avoid artificial preservatives, and there is something called **Sasa Bamboo** which grows very freely all over Japan and it has a natural antibiotic, antifungal, antiviral effect. As a matter of fact, fishermen, when they go fishing in Japan, wrap fish in the Sasa Bamboo leaves to keep it fresher. It's very common if you are traveling in Japan and eating on the train or somewhere that they will also wrap it in Sasa Bamboo, so there's rice cakes, sushi, etc. popularly used today as well. They decided to put Sasa Bamboo as a natural preservative in the H1X1 extract.

The Sasa Bamboo itself has been shown to have significant anti-tumoral effects of its own, so they've got this along with boosting the immune system and fighting off bacterial and viral infections, and also for anti-tumor effect. I had a chance to watch a study done where a three-year-old vial of the H1X1 was tested just to see, after three years, (number 1) what would be the likelihood that the product was still potent, and (number 2) that there wasn't anything growing in it, because it did not

have an artificial preservative. And after three years it was exactly the same; there was no change in potency, no change in the product at all.

## **A Valuable Vial**

So what you have here is a little vial of drops, and you take a few drops a day, and it has the Agaricus Blazei mushroom, which again, has shown incredible benefits for health and very significant benefits in the area of cancer treatment. You are now cancer treatment guys, so remember that, but certainly only people like me can use it for that. Think about what you have:

- o You've got the highest grade Agaricus on the planet
- o You've got one that is kept in a vault so that it can't be contaminated
- o You've got one that is genetically fingerprinted and processed, using the 10-phase process that pulls out a whole lot more nutrients in it
- o You've got one that has the Sasa Bamboo as a natural preservative, which also has its own health benefits

Aside from all of that, both the Agaricus Blazei H1X1 and the Sasa Bamboo are environmentally friendly and are not doing anything to destroy anybody's environment. The Sasa Bamboo is not an endangered or limited species of plant in a controlled environment. It's very easy to use as well.

## **Personal Experiences with Cancer and Compromised Immune System**

Let me talk a little bit about my experiences. I mentioned earlier that I was diagnosed with cancer in 1992 and I was told I would never hear the word "cure." I went through chemotherapy and I went through a very aggressive chemotherapy, but the cancer was quite bad and it gave me the opportunity to consider a clinical trial (which is a very high dose drug), and none of us wants to do that, but back then my complete frame of reference was allopathic medicine, drugs, and surgery and radiation. [I, PWarren refer to this model as "Slice and dice, zap and pickle" -- surgery, radiation and drugs]

When I went through the chemotherapy, it really hurt my immune system in every way, and it turned out that I wound up getting sick a lot after that. If there was a cold even thinking about happening in my community, I would be the first one to get it. I was almost like the early warning system for something happening in my community. I would get it first; it would last a long time, and then I was usually in for a weak cycle again and would catch it on the back-end of the outbreak. So it almost became ridiculous because I was so sick. I had always been a powerhouse and could keep myself going, and I didn't feel like that a lot of the time.

## **Using the Agaricus H1X1**

I learned about the **H1X1**, which is now **AgariGold**, and it answered my question, "What am I going to recommend for people, and what do I want to use myself?" So I started using six drops a day, which is a pretty heavy amount for people who just want to stay healthy. At that point I didn't know how much I should take, so I just took six drops a day. I certainly wasn't healthy, but I wasn't profoundly ill either. I had a weakened immune system and I found that over the months I didn't get a cold, I didn't get the flu; I didn't get anything. And now after five years, maybe I have had one cold, maybe..and maybe the flu one time, and that's it.

People who have known me for a long time know that I was sick a lot, and so I do use the H1X1 for myself. I still take six drops a day from a little vial which has about 200 drops in it. I put it in a little bit of water (about two ounces of water) and swish it around, and then drink it. It has a very pungent taste. It tastes a lot like you are licking a bouillon cube and tastes a little mushroomy; it doesn't taste bad at all. If you are giving it to a child who may not like the taste of mushrooms, you could put it with something else and it would be fine. It's not sensitive to heat or cold; you can put the liquid in a hot beverage or soup if you want to – you can eat it that way. When I'm traveling on an airplane I take an extra six drops right before I get on the plane and take an extra six drops after I get off because the recycled air is full of germs that I really don't want to be exposed to. If I feel like something is starting to come on, like I am catching a cold or anything, I would take it immediately, and I would take more than six drops. I would take more like 10 or 12 or 15, so that would be part of the general maintenance.

### **Using the AgariGold with Children**

Now, with children, I have a lot of friends who use this for their health, and their children also do it. I share my personal feeling that I would not give it to a child under two years of age because their immune systems are immature. I personally do not recommend it. Over two years of age is fine. The question is **how much?** You really can just guess and estimate. Look at the size of the child – maybe one drop a day, or two. If it's a child that's prone to a lot of colds or ear infections or other problems, you may want to go a little bit higher than that. You can't overdose on it at all.

### **Pregnancy and Breast Feeding**

Another question that comes up is, “What about in pregnancy and during breast feeding?” and, of course, the answer is, “We never recommend anything during pregnancy or breast feeding. That's always between the person and their physician.” That's your standard answer because if anything comes out wrong with that baby, the people whose baby it is will be wondering, “How did this happen?” and you don't want to be on the list of possible things that are crossing their mind. So we say, “Between pregnancy and breast feeding we can't recommend anything – that's between you and your doctor.”

I would tell you that I, personally, would not hesitate to use the mushroom extract at all during pregnancy and I would not personally hesitate to use it during breast feeding. Remember, I said that babies less than two years have immature immune systems, but mothers can eat peanut butter and they can eat strawberries and things, and that doesn't cause an immune reaction, so your answer is between you and your doctor, but Dr. Davidson says she would certainly feel very comfortable using it.

### **Pets Love it, too!**

I want to share a story with you about a dog that was extremely ill with an autoimmune disorder, and within a very short period of time he had a truly miraculous recovery with using this part of the therapy that the dog underwent. My cat, who is about 12½#, has a big sinus problem. She is about a dozen years old and she has a nasal problem—she has been sick almost since she was a kitten. About six months out of the year I have to put her on antibiotics for this chronic sinus problem, so I give her a higher dose than usual. In the last three years maybe she has been on antibiotics one time. This keeps her lots better than she ever was before. In her case I just put it in her cat food. It can be used by a lot

of animals just to stay healthy. A lot of them are dealing with cancer diagnoses, and I have been using the AgariGold in conjunction with Natural Cellular Defense.

I would also mention that its' very helpful for animals dealing with cancer diagnoses, or just for keeping them vigorous. I do have some dogs and cats that have been living a long time with cancer diagnoses and I have been giving them the mushroom alone or in conjunction with the NCD.

### **Some Case Histories**

I am going to share a few stories before I close. Some of these are people who are somewhat ill, and some of them are really very ill, so I am going to caution you that you have to be respectful to what they want to do and what they want to know. When I deal with people with dire diagnoses I give them a whole lot more than six drops a day. We are doing very significant, very high doses frequently.

This case is a young girl in her 20's and she has a **case of MRSA**, which is very resistant to antibiotics. She had skin lesions all over. She started using the mushroom in addition to the antibiotics and the skin lesions started going away quite rapidly. It was delightful, but about three weeks later she stopped the mushroom extract and the skin lesions started coming back and she wanted to go on the mushroom again, and so they got her some and the skin lesions went away, but then after she discontinued her antibiotics and still continued on the mushroom, she had a good eradication of the outbreak of MRSA, which was great.

Another example would be a gal with a **very bad sinus problem**. She was 45 years of age and she had undergone multiple surgeries, problems done at about age three. She had been sick for a long time and had been referred to me by a friend who has been treated with my assistance for cancer diagnosis. Her problem was they wanted to do more surgery and she was really trying to avoid that and wanted my opinion. She went on high doses of the mushroom extract to begin with (about 20 drops twice a day) for a period of time, and she was very good at seeing when infection was starting up again. She noticed quite rapidly that she was not getting infected after she started using the H1X1. Actually, she has been on that now for three years and has been able to stay off antibiotics completely. She's down to about 10 drops a day now. She jumps it up a little bit if she feels like something is trying to happen, but it's a very nice, easy way to modulate her own immune system.

**In the cancer world** (I have a lot of them – there are just so many), some of whom have elected not to have chemotherapy or they've had it and it didn't work, others who are having radiation therapy, and others who are trying to decide – and I've found that I very frequently will have the mushroom (the H1X1) being used at the same time they are using chemotherapy.

A good example of it is a 32 -year-old female. She was 30 when she was diagnosed with **breast cancer**; she had a bilateral mastectomy, chemotherapy and radiation. She had a reoccurrence, which was involving brain, liver, lung. She got hold of me. She was in chemotherapy, but she also wanted to take the mushroom in addition to the chemotherapy. Actually, there are some doctors in China who use H1X1 specifically as part of their chemotherapy and cancer prevention modality. It is being used right now in 11 or 12 human studies by the National Institute of Health, but it is being used I conjunction with chemotherapy, not as a stand-alone agent.



In her case she went on the mushroom as well. Three or four weeks later we took an x-ray of the tumors in her lungs and they had gone down about 70%, which is great. She ran into a nutritionist who didn't want her to take anything, which I didn't appreciate because the patient got confused and stopped the mushroom and then started getting weaker and weaker and told her mother she really didn't feel well. They rechecked her a month later after just being on the chemotherapy and the tumors had not gotten any larger, but they had not gotten any smaller either. They had stabilized.

She wanted to get back on the mushroom, and so she started back up. Her energy levels went back up again and it makes it a lot easier for her to deal with the chemotherapy. She has been on the mushroom for about 18 months. She finished the chemotherapy and is on some sort of long-term, low-grade chemo type of things and is doing quite well with the combination of those things.

### **A Great Gift**

One more story before I finish up: I was leaving the convention in Orlando on a Sunday morning about 6:00 a.m. and I had a town car that was arranged by Waiora. I got to the airport and the town car driver said that someone had given him a sample of the AgariGold (a whole bottle costs \$40) and I thought that was a pretty generous act! He said he had had a cold for about five days and he almost never got sick, but had been really sick for five days, so he took six drops of the product just a few hours before and was feeling so much better. So whoever gave that man the sample (and I don't know his name), I can tell you he was very excited with his results! It kind of made me smile because I have seen that so many times over the last five years when I have had access to this particular H1X1. It is very likely that there is a direct correlation with your body's ability to function better, and it's an immune function with all of the components of the AgariGold in your body.

I often have people use the NCD and the mushroom together, both in doses higher than the labels indicate. Sometimes I am asked how much I have used, and it might be a couple of vials a day, and of course, this brings up economic concerns. If you have 10 people with the exact same diagnosis on paper, you would not give them all the same dosage. I really customize it to the person, so I would caution you to be gentle. Learn your product. There is a CD I have made that just tells the story of H1X1, and that may be a good tool for you to use and let people decide for themselves. Just be gentle with them. The CD is entitled *Dr. Daria Davidson Speaks Out* and it is available at [www.waioratools.com](http://www.waioratools.com) or [www.healthyagingtools.com](http://www.healthyagingtools.com)

### **Section Two (pp. 9-31) MUSHROOM OF LIFE: Agaricus Blazeli: Technical report**

An inside look into the Agaricus Blazeli Murrill mushroom, featuring the health benefits of the new hybrid superstar -- H1X1

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## **1. INTRODUCTION**

For centuries, inhabitants of the mountainous rain forests of Piedade, near Sao Paulo, have included *Agaricus blazei* in their diets, and as a result, they have experienced phenomenal health, as evidenced by their lower incidence of common and degenerative diseases as compared with inhabitants from surrounding areas. Centurions, (those who live to be 100 or more), are not uncommon among the native population. Because its benefits are so well-known in the region, locals revered *Agaricus blazei* as the "Mushroom of Life."

Scientists have crossed the heirloom Piedade variety of *Agaricus blazei* (the most potent variety-which undergoes DNA fingerprinting to maintain its integrity) with more than 200 other high potency *Agaricus blazei* cultures to determine if they could create a hybrid with even more health benefits. The result, H1X1, a new *Agaricus blazei* hybrid, is so effective that it has been granted patent pending status, and is the only health-promoting *Agaricus blazei* mushroom to undergo research sponsored by the National Institutes of Health.

For a long time, the only thing the average person needed to know about mushrooms is whether or not they wanted them on a pizza. But in recent years, the average consumer has been exposed to increasing varieties of culinary mushrooms in the produce section of their neighborhood grocery and in gourmet dishes at local restaurants, but perhaps more surprisingly, in the supplement aisles at health food stores.

Exotic Asian mushrooms like shiitake, maitake and enoki are becoming household names, not just for their culinary pizzazz, but also for their potential health benefits, particularly in cancer care, antiviral protection and immune enhancement. Many people are surprised to learn that these medicinal mushrooms, which take center stage in Asian cooking, have been used for centuries in China and Japan as Traditional Chinese Medicine (TCM).

Mushrooms have been around for a very, very long time, with one of the oldest living colonies found in the U.S., at the Malheur National Forest located in the Blue Mountains of eastern Oregon. This single fungal colony of more than 2,200 acres is believed to have already been around for at least 2,400 years!

In fact, there are currently more than 14,000 known species of spore-bearing fungi, commonly known as mushrooms, which have been identified to date -- over 1,500 just in Japan. Of all the species, about half are totally inedible, another forty or so percent are either not worth eating or cause illness. Approximately one percent of mushrooms are toxic and deadly if eaten. One of the most dangerous, the "death cap" mushroom is believed to have caused the demise of the Roman Emperor Claudius (at the hands of his wife, who fed them to him).

The remaining few mushroom species, however, do just the opposite: They are culinary and nutritional heavyweights. For those who thought mushrooms offer little nutritional value, think again! Although naturally low in calories, many varieties of mushrooms are high in dietary fiber, essential amino acids, vegetable proteins, and several vitamins and minerals, including iron, zinc, thiamine, riboflavin, niacin, biotin, ascorbic acid, selenium, and high in potassium, while being low in sodium and cholesterol free.

Extensive studies by medical researchers and ethno-botanists have found that several species offer more than purely nutritional sustenance. They actually boost immune function, increase our resistance to disease, and promote overall health. Scientists have identified immune system enhancing, preservative, cancer fighting, and heart protective effects in medicinal mushrooms, and they may be useful in combating dementia, preventing osteoporosis, and treating diabetes and AIDS. Among them, maitake, shiitake, chaga, and reishi mushrooms have all grabbed the attention of the health community. Even some psilocybin producing mushrooms (a.k.a. magic or psychedelic mushrooms) have yielded promising results when small extracts were used in the treatment of mental disorders, such as obsessive compulsive disorder, as well as cluster headaches and migraines.

Now that mushrooms are cropping up more and more in the health care arena, it is time to learn the benefits of this edible health food and discover which medicinal mushrooms offer the safest and most effective solution for improving health and promoting wellness.

## **2. AGARICUS BLAZELI: MUSHROOM OF LIFE**

### **2.1. Introduction**

"The Mushroom of Life" may sound like a chapter title in a J.R.R. Tolkien book or a song by the Grateful Dead, but it is actually the common name for a species of mushroom that is believed to promote good health, long life, increased vitality and lowered risk of disease.

In Traditional Chinese Medicine, its adaptogenic properties are believed to help balance the body's systems, making it stronger and less susceptible to illness. Scientists believe that its unique polysaccharide content is part of what gives it anti-tumor potential and powerful immune-enhancing properties. The *Agaricus blazei* mushroom species shows so much promise, in fact, that it is currently being used by doctors in Japan and China as an adjunct treatment for cancer patients.

Historical uses for *Agaricus blazei* are varied, ranging from cold and flu prevention and energy boosting, to constipation and headache relief. In short, the mushroom has long been associated with less illness and longer life.

### **2.2. The origins of *Agaricus blazei***

Most of us probably associate "medicinal mushrooms," or edible mushrooms that have known health benefits, with Asia. Science news sites often mention studies on the cancer-fighting powers of reishi, shiitake or maitake mushrooms, all originating from China or Japan. However, it may surprise you to discover that one of the most promising health-promoting mushrooms in recent years actually comes from the heart of the Americas.

For centuries, inhabitants of Brazil, specifically those from the mountainous rain forests of Piedade, near Sao Paulo, have included *Agaricus blazei* in their diets, and as a result, they have experienced phenomenal health as, evidenced by their lower incidence for common and degenerative diseases compared with inhabitants from surrounding areas. Centurions, (those who live to be 100 or more), are not uncommon among the native population. Because its benefits are so well-known in the region, locals revered *Agaricus blazei* as the "Mushroom of Life."

By the early 1970s, scientists identified the wild *Agaricus blazei* mushroom as one of the reasons why Piedade inhabitants had longer lives and lower disease risks. Not only did the mushroom itself have powerful healing potential, but the lush environment in which it was cultivated offered the best nurturing setting for maximum potency and bio-availability.

Sadly, many regions where the mushroom grew wild in Brazil have disappeared due to urban development, but the original cultures from these wild mushrooms were salvaged and the properties of the *Agaricus blazei* mushroom continue to be studied in Japan and around the world. Efforts have also been made to replicate the essential aspects of *Agaricus blazei*'s growing environment for maximum benefit. Emerging research reveals that this South American treasure may hold a key to preventing disease, slowing the aging process and promoting an overall increase in health and longevity.

### **2.3. Patented *agaricus blazei* blends**

*Agaricus blazei* mushrooms have been the focus of extensive scientific research for several decades. Now that many health benefits have been confirmed, scientists are turning their attention to determining which *Agaricus blazei* varieties are best and how to cultivate maximum benefit and potency from them.

In fact, scientists have crossed the heirloom Piedade variety of *Agaricus blazei* (the most potent variety -- which undergoes DNA fingerprinting to maintain its integrity) with more than 200 other high-potency *Agaricus blazei* cultures to determine if they could create a hybrid with more health benefits.

One type of *Agaricus blazei* in particular has gained credibility in the scientific community. This potent new *Agaricus blazei* hybrid is so effective that it has been granted patent pending status. HIXI is the only health promoting *Agaricus blazei* mushroom to undergo research sponsored by the National Institutes of Health. These researchers found this new *Agaricus blazei* strain to be effective for safe immunity modulation and overall health promotion. It also was tested to have higher beta glucan levels than regular *Agaricus blazei* varieties.

Beta glucan:

- Supports healthy cardiovascular function
- May lower unhealthy cholesterol levels
- Stimulates activity of various immune cells, including cytokines
- Promotes healthy blood-glucose levels
- Exhibits anti-cancer properties
- Restricts activity of pathogens, including bacteria, viruses and fungus
- Enhances overall immune function

This new hybrid has origins in North and South America. Scientists bred the *Agaricus blazei* variety first found in Brazil with a complimentary U.S. *Agaricus blazei* mushroom found in the fields of coastal California to create a powerfully potent *Agaricus blazei* with more potential than either variety on its own. In fact, the germplasm for the HIXI hybrid is so valuable that it is under lock and key, ensuring that each mushroom's properties and the resulting hybrid are thoroughly maintained and safeguarded.

HIXI production is carefully monitored to make sure the genetic integrity of each crop matches the original variety to ensure that efficacy and potency are consistent. Every aspect of the growing environment -- from temperature and soil to watering and nutrition -- are monitored to ensure consistency and certified organic status.

**2.4. H1X1-blend agaricus blazei: highlights**

- Patent pending unique variety for maximum health benefit
- More potent than any other Agaricus blazei variety
- Higher beta glucan levels than regular Agaricus blazei varieties
- Subject to DNA fingerprinting to ensure efficacy and potency
- Potency is safeguarded with a patented organic growing process that replicates the essential growing conditions of the original Piedade Agaricus blazei
- Research on H1X1 was sponsored by the National Institutes of Health
- Uses patented extraction technology to ensure pure and bio-available product

**3. AGARICUS BLAZEI: NUTRITIONAL MAKEUP**

The Agaricus blazei mushroom is considered a superfood because of its superior nutritional makeup. Patented Agaricus blazei extracts, like HIX1, may offer the best nutrition, with a nutritional profile that includes more than 100 key nutrients.

**3.1. Important bioactive components of Agaricus blazei include:**

Polysaccharides	Magnesium
X-glucans	Calcium
Beta-glucans	Zinc
Heteroglucans	Iron
Beta-glucan protein complex	Manganese
RNA-protein complex	Unsaturated fatty acids, mainly linoleic acid and conjugated linolic acid
Dietary fiber	
Vitamin B1, B2 and niacin	Hydrolase
Vitamin D2	Oxidase
Potassium	Proteinase

**3.2. Polysaccharides**

Complex sugars, called polysaccharides, in Agaricus blazei have documented immune-boosting capabilities. For instance, polysaccharides can stimulate the production of immune cells called cytokines that aid immune system communications and kick-start immune response, as well as stimulating the bone marrow to produce other immune cells. Some cytokines include interleukins and tumor necrosis factor or TNF. Cytokines also stimulate the activity of natural killer (NK) cells. Although several bioactive compounds in Agaricus blazei may provide health benefits, its polysaccharide content has attracted the most interest. Polysaccharides have shown promise in not just regulating immune function, but also as a cancer treatment and Agaricus blazei contains possibly the highest level of one particular type of polysaccharide called beta glucan.

The regulatory effects of beta glucans on the immune system provide extra help when the system is under stress. Those undergoing chemotherapy, for instance, may find an immune benefit from taking *Agaricus blazei*.

### **3.3. Beta glucan**

The most important polysaccharide found in *Agaricus blazei* is branched 1,3-1,6 beta-D-glucan. As just mentioned, *Agaricus blazei* HIXI contains higher levels of these beta glucans than other medicinal mushrooms.

Beta glucans are long-chain carbohydrates found in the cell wall of some plants. Among its many attributes, beta glucans are a potent antioxidant and are capable of triggering immune responses (specifically macrophages, monocytes, neutrophils and precursors) to respond to potential pathogenic threats. We will discuss the roles of specific immune cells later in this book, but basically, beta glucans stimulate immune cells, cells that activate immune response and immune cell production, as well as immune cells that fight tumor cells.

Other studies have found that beta glucans may offset the effects of radiation therapy, and still others have found potential in using mushroom derived beta glucans to lower serum levels of LDL and VLDL cholesterol as well as triglycerols. In fact, more than thirty years of research supports these benefits, as well as the safety and nontoxic nature of this group of polysaccharides.

### **3.4. Natural steroids**

Six different types of natural steroids have been identified in *Agaricus blazei* with anti-cancer potential, particularly useful in the treatment of cervical cancer.

### **3.5. Linoleic acid**

Linoleic acid is an unsaturated omega-6 fatty acid, an essential fatty acid. It is called essential because it is a dietary requirement for humans and other mammals since the body cannot produce it. A deficiency of omega-6 can cause slow wound healing and hair loss, among other things.

Linoleic acid is responsible for producing prostaglandins, required by every human cell and necessary for maintaining health. It must be constantly replenished. Linoleic acid maintains healthy cell membranes and cellular metabolism, and is indirectly involved in blood pressure control, inflammation, blood clotting, body temperature control, and other important bodily functions.

Most of us are aware of the deadly effects of severe malnutrition; what we may not realize is that even minor deficiencies can prove deadly over time and that, chances are, you probably suffer from at least one nutrient deficiency. The American Cancer Society estimates that approximately one-third of cancer deaths annually in the United States can be linked to diet and nutrition. A recent study linked a deficiency of the B vitamin folate to the development of Parkinson's disease. And in a 2007 PBS series titled *Hidden Epidemic: Heart Disease in America*, nutrient deficiency was presented as not only a factor in developing heart disease, but also as the primary cause of cardiovascular disease.

### 3.6. The dangers of nutrient deficiency

The nutrient-rich content of *Agaricus blazei* provides another type of disease protection. The USDA reports that approximately 92 percent of Americans do not receive sufficient nutrients in their diet, and numerous "lifestyle" diseases have been linked to a lack of proper nutrition including:

Alzheimer's disease	Stroke
Cancer	Arthritis
Diabetes	Depression
Irritable bowel disease	Heart disease
Parkinson's disease	Osteoporosis
	Premenstrual syndrome

## 4. THE SCIENCE BEHIND AGARICUS BLAZEI

### 4.1. Introduction

Studies examining the health potential of *Agaricus blazei* date back more than thirty years. Two major contributors to early research on *Agaricus blazei* were Dr. Shoji Shibata, professor of pharmacology at Tokyo University and Dr. Tetuo Ikegawa at the National Cancer Center (Japan). Their joint efforts were presented at a conference of Japans' Cancer Association and their Pharmacological Association back in 1980. They presented information specifically on the potential of *Agaricus blazei* as an immune booster and cancer fighter. Since that time, research has only grown with respect to the mushroom's potential in this area and others.

Focus has turned specifically to its potential for use in cancer treatment, immune system potentiating and overall body balance. It has shown great promise in these areas, but demonstrated potential also exists in studies examining *Agaricus blazei*'s ability to boost energy levels, support the digestive and cardiovascular systems, and lower blood glucose, serum cholesterol, and blood pressure. The rest of this paper will examine specific ways *Agaricus blazei* can improve health and the research that supports these claims.

The Benefits of <i>Agaricus Blazei</i>	
Promotes overall health and well-being	Supports a healthy digestive system
Provides powerful immune enhancement and immune modulation	Protects the body from free radical damage, which helps slow the aging process and prevent several degenerative diseases
Increases NK (natural killer) and T cell and macrophage activity	Boosts energy levels
Promotes a healthy cardiovascular system by raising HDL and lowering LDL cholesterol levels	Supports normal blood sugar levels
Anti-tumor activity, particularly cancer cell apoptosis and cytotoxicity	Improves liver function and may have potential in treating hepatitis
	Benefits allergy sufferers by regulating immune function

*"The mushroom contains beta glucans, a group of polysaccharides (complex sugars) believed to be the compounds responsible for its immune boosting effects. In addition, research has shown that *Agaricus**

*blazei* has anti-tumor and anti-viral activity, as well as moderating effects on blood sugar and cholesterol. In Japan and Brazil the mushroom is widely used by cancer patients."

Dr. Andrew Weil, M.D.

## **5. UNDERSTANDING THE IMMUNE SYSTEM**

### **5.1. Introduction**

Our immune system is an intricate and finely tuned defense network designed to protect the body from dangerous pathogens, toxins, cellular mutations and other potential hazards. The immune system is also responsible for helping repair damaged cells and tissues, heal the body and restore balance to body systems for optimal function. It also has the ability to learn and adapt so that it can remain effective against ever-evolving bacteria, viruses and other microbes.

Each time the immune system identifies a threat, an elaborate and dynamic chain reaction is sparked into action to neutralize it. An organized effort by many different types of cells, proteins, organs and tissues is needed for threats to be eliminated. Considering the complexity of human immune response, it is not surprising that things can go wrong. Immune system dysfunction can result in autoimmune diseases or suppressed immune response.

Autoimmune diseases result when the immune system cannot distinguish the body's own cells from foreign and dangerous cells. As a result, the body itself is attacked. Antibodies and T cells may attack cells or organs, and this can result in a number of health conditions, including rheumatoid arthritis, lupus erythematosus, allergies, asthma; dermatitis, diabetes mellitus type 1, multiple sclerosis and fibromyalgia.

Compromised or suppressed immune function is also common and can be fatal. Causes of immune suppression are many and can include exposure to environmental stressors like xenoestrogens (dangerous chemicals that act like estrogen in the body), pesticides, and pollutants; free radical stress; some prescription drugs; poor dietary habits; psychological stress; strenuous physical activity; chronic low-grade infections; and even just the effects of aging can leave us for susceptible to immune suppression. These vulnerabilities can take years to emerge, but inadequate or dysfunctional responses can lead to genetic mutations, such as those that cause malignant tumors.

### **5.2. Common Autoimmune Diseases**

- rheumatoid arthritis
- lupus erythematosus
- allergies
- asthma
- dermatitis
- diabetes mellitus type 1
- multiple sclerosis
- fibromyalgia



### **5.3. Signs of Weakened Immune Response**

- Low energy, endurance
- General malaise or fatigue
- Frequent infections, slow healing
- Loss of appetite or unexplained weight loss
- Diarrhea, irritable bowel or digestive upset
- Low-grade fever
- Swollen lymph nodes
- Cold sores, rashes or more severe allergy symptoms
- Changes in sleep patterns
- Changes in menstrual cycle in women

Serious conditions associated with immunosuppression include chronic fatigue syndrome, cancer, and acquired immune deficiency syndrome (AIDS) caused by the retrovirus HIV.

To understand how *Agaricus blazei* can help with poor immune function, we first need to understand some of the main cell types involved in immune defense.

### **5.4. Natural Killer cells (NK cells)**

Natural killer or NK cells are cytotoxic white blood cells (lymphocytes) that operate as part of the innate immune system, providing a non-specific response to immediate threats. Basically, NK cells are an essential first line of defense against dangerous invaders.

Discovered in the 1970s, NK cells help to neutralize malignant cells involved in cancer and also eliminate cells compromised by viruses. They work by releasing small protein granules that seek out damaged cells and trigger cell death in those cells (apoptosis). NK cell deficiency has been associated with, among other things, increased susceptibility to herpes infection. Upon discovery of a potential danger, NK cells act quickly to identify it and attack it.

### **5.5. T Cells**

T cells (the T stands for thymus) are another type of lymphocyte. There are many types of T cells, including helper T cells, cytotoxic T cells, memory T cells, natural killer T cells, regulatory T cells, and autoaggressive T cells.

All T cells originate in the bone marrow and develop with the aid of the thymus. T cells may be called on to destroy tumor cells or those infected by viruses. They may also enhance immunity in other ways and help with regulatory functions. Instead of providing nonspecific immune protection like NK cells, T cells offer specific defense (called cell-mediated immunity).

### **5.6. Macrophages**

The term macrophage comes from the Greek meaning "big eaters" because they ingest foreign microorganisms in order to eliminate them from the body. Cells that eat foreign pathogens are referred

to as phagocytes. Macrophages originate from leukocytes (white blood cells) called monocytes, which protect against blood-borne pathogens.

Macrophage scavengers can be involved in specific and non-specific defense and can survive for months or even years. They not only engulf and eliminate stationary and moving pathogens, but also deal with other types of potentially harmful debris (such as dust in the lungs or the remnants of dead cells or tissues). If debris is not removed promptly, this may cause chronic inflammation. Debris must also be removed by macrophages from the liver, bones, spleen, brain and connective tissues.

Macrophages can also stimulate other white blood cells into action. Dysfunctional macrophages are involved in the plaque buildup of atherosclerosis, can aggravate the effects of flu on the throat, and can be hijacked by HIV to help replicate and spread the virus through the body. They may also help the spread of cancer cells as well.

### **5.7. Tumor Necrosis Factors (TNFs)**

TNFs are part of a family of cytokines usually produced by macrophages with the job of programming cell death, called apoptosis. Their main role is immune cell regulation, but they are implicated in systemic inflammation, as well. Dysfunction in TNFs has been linked to several diseases, including cancer, rheumatoid arthritis, ankylosing spondylitis, psoriasis, asthma, Crohn's disease and insulin resistance.

### **5.8. Compromised immunity: The big three**

Three factors can compromise immune function, and more particularly, NK cell activity are *aging, stress and pollution*.

Studies show that with *age*, we become more susceptible to diseases like cancer, and our immune system becomes increasingly less effective. In one study on old and young mice exposed to chemical carcinogens, it took the young mice three months to develop cancer, while the older group was affected in merely three weeks. Dealing with breast cancer in particular, consider a 20-year-old's and 70-year-old's respective risks. For the 20-something, the risk is 0.04 percent, while for the 70-something, it jumps to 4.31 percent.

*Stress* is also a significant contributor to suppressed immune function. (Studies have shown that chronic stress; even low-grade stress, whittles away at our immunity until it is compromised.) Things like work stress, driving in traffic, even positive things like getting married or having a baby, can add to our ongoing stress levels if we manage our stress poorly. Research has shown that stress can reduce the effectiveness of macrophages, lowers circulating antibody levels, lowers antigen response, and reduces lymphocyte cytotoxicity. Stress, through a weakened immune system, has also been linked to the development of certain cancers including breast cancer and leukemia.

The third factor, *pollution* is also a known immunosuppressor. Some research has pointed to higher incidences of cancer among inhabitants of urban centers than those living in rural areas. One reason for this may be air pollution. Pollutants in drinking water may also contribute, and studies have found that just one week of exposure to pollution can drastically reduce NK cell activity.

If each factor individually has such a strong effect on cancer risk, consider the risks when all three are combined.

## **5.9. Tips for boosting immunity**

In addition to *Agaricus blazei* supplementation, the following tips will help encourage optimal immune function:

- Avoid tobacco and alcohol consumption
- Get at least 8 hours of sleep each night
- Practice effective stress management
- Try relaxation techniques
- Avoid overly processed, sugary and fatty foods
- Drink plenty of pure spring water
- Maintain a nutritious, organic and balanced diet
- Avoid caffeine
- Minimize exposure to environmental toxins and free radicals
- Stay physically active

## **6. AGARICUS BLAZEI: NATURE'S SUPER IMMUNE BOOSTER**

### **6.1. Introduction**

Medicinal mushrooms like the *Agaricus blazei* have proven immuno-stimulating properties with the potential to keep us healthy, lessen the frequency and severity of illnesses, and allow us a speedier recovery when we do become ill. Below is a short list of conditions where *Agaricus blazei* supplementation shows potential as a treatment:

- Cancer
- Diabetes
- Constipation
- High blood pressure
- Chronic fatigue syndrome
- Atopic dermatitis
- HIV/AIDS
- Hepatitis
- Arthritis
- Elevated cholesterol
- Lupus

### **6.2. How *Agaricus* enhances immune function: What the research shows**

Beta-glucans in *Agaricus* have documented abilities to stimulate cytokine production, including natural killer (NK) cells, interleukins, and tumor necrosis factor or TNF. Cytokines aid immune system communications and kick-start immune response, as well as stimulating the bone marrow to produce other immune cells.

In one study, NK cells isolated from mice given daily *Agaricus blazei* treatments and from mice receiving no immunotherapy were injected into leukemia cancer cells. The same number of NK cells from *Agaricus blazei* and control mice were injected, and within three hours, NK cells from *Agaricus blazei* mice killed between 40 and 57 percent more cancer cells than those from the control group.

In another study, NK cells were treated with *Agaricus blazei* for ten hours in concentrations of 2.5 percent, 5 percent, and finally 10 percent. NK activity tripled among all groups.

A study carried out by the Tokyo University, the National Cancer Center Laboratory and the Tokyo College of Pharmacy compared the effectiveness of fifteen different beta glucan-rich mushrooms on sarcoma cancer cells. Animals infected with this cancer cell usually experienced widespread malignancies within a month and most died.

In those animals who received mushroom extract treatment over a ten-day period, anti-cancer effects recorded five weeks later ranged from 44 to 99.4 percent, and complete recovery rates ranged from 20 to 90 percent. In this study *Agaricus* was most effective, resulting in 90 percent complete recovery rating (meaning they recovered from the initial cancer exposure and a second exposure failed to cause cancer in the animals) and 99.4 percent anti-cancer effect. Furthermore, a much lower dosage was needed to achieve this effect compared with dosages of other mushroom extracts.

Another study conducted at Kobe University in Japan found that the polysaccharides in *Agaricus blazei* boosted levels of T cells, helper T cells and cytotoxic T cells. This is confirmed by research from the Korea Research Institute of Bioscience and Biotechnology which found that the *Agaricus blazei* mushroom affected innate and cell-mediated immunity by enhancing cytotoxic T cells, NK cells and macrophages.

Research from the Japanese National Institutes of Health also supports the potential of medicinal mushrooms like *Agaricus blazei* for treating HIV infected patients since it boosts T-helper cells. In tested subjects, T-helper cell counts increased over three months of treatment and related symptoms decreased.

### **6.3. Beta glucans for optimal immune response**

- Prompts the release of TNF or tumor necrosis factor
- Activates T cells and NK or natural killer cells
- Stimulates interleukin and interferon production
- Boosts phagocytosis activity
- Increases cytokine levels

### **6.4. The antioxidant power of *Agaricus***

The antioxidant potential of *Agaricus blazei* mushroom has been documented in research, and patented varieties of *Agaricus blazei* may offer even higher antioxidant protection. Because of its antioxidant activity, *Agaricus blazei* may offer benefit in the areas of cancer prevention and treatment, heart health; and chronic disease. Let's take a moment to understand the reason why antioxidants are so essential to good health and how they work.

## **6.5. Why do we need antioxidants?**

No matter how healthy our lifestyle or environment, every day we live our bodies are exposed to a potentially deadly cellular process called oxidation. By the simple act of breathing oxygen, we put our cells at continual risk. The same way that oxidation rusts iron and discolors a banana, it also causes the damage of healthy human tissues on a cellular level resulting in aging and decreased health with the help of free radicals.

What are free radicals? Although they are a natural by-product of cellular metabolism, free radicals are unstable and highly reactive in the body because they lack an electron and are constantly scavenging other healthy cells for a replacement. In fact, experts estimate that each cell in the body experiences 10,000 free radical attacks an hour, 24 hours a day. Unless these scavengers are stopped, they will steal electrons from healthy human cells, leaving a trail of damaged and unhealthy cells in their wake and creating a chain reaction of dangerous cell mutations.

When cells do their jobs right -- divide, make energy, perform their job and pass on their genetic information correctly, the cell and the organism are healthy. If the cell becomes unhealthy or mutates, dysfunction, damage, chronic disease, aging and death may result.

Even "normal" levels of free radical exposure are dangerous, but most Americans today are exposed to above-average levels of free radicals from environmental toxins such as tobacco smoke, environmental chemicals and pesticides, contaminants in our air and water, radiation, and dietary trans fats. Even exercise and sunlight exposure can increase our free radical exposure. The effects of this "oxidative stress" are potentially devastating. Moreover, our ability to fight oxidative damage decreases with age and can be affected by our stress levels, overall health, sleeping habits, diet and other lifestyle factors.

Antioxidants offer protection from the dangerous oxidative and carcinogenic effects of free radicals by deactivating free radicals in the body, neutralizing their effects and preventing cell damage, thereby reducing your risk for disease and slowing the aging process.

## **6.6. The benefits of antioxidants**

Simply stated, antioxidants are essential to staying young and healthy. The protection daily antioxidant consumption offers is immeasurable, and statistics show that modest intake can dramatically reduce health care costs. Despite this fact, most Americans don't consume enough dietary antioxidants from their diets to get even minimum protection.

If we are not getting the antioxidants we need from our diets, supplementation may be the best source of free radical protection required to stay healthy in an increasingly toxic environment. Antioxidants are arguably one the best ways to prevent disease, slow the aging process and promote overall wellness.

## **6.7. Chronic disease and oxidation**

Cancer is usually associated with cellular mutations, but oxidative damage has been linked to more than sixty diseases including:

- Heart disease
- High cholesterol
- Diabetes
- Cataracts
- Arthritis

Experts estimate that 85 percent of chronic diseases are related to free radical damage.

## **7. THE CANCER THREAT**

### **7.1. Introduction**

Cellular mutation, as we just discussed in the free radical section, originates on the cellular level. If the DNA is damaged, cells can act in dysfunctional and dangerous ways. Instead of duplicating healthy cells at a normal rate, cancerous cells behave abnormally and multiply at a faster-than-normal rate.

Of course, at any given time, there are thousands of mutated cells in the body capable of causing cancer, but these cells are usually dealt with before they become a threat. No one knows exactly what causes these cells to sometimes avoid detection and lead to the development of a tumor, but compromised immunity is one plausible connection, and protecting our immune system may go a long way towards preventing cancer.

We do know that cancerous cells have found some clever ways to avoid detection and elimination by immune cells. Cancer cells may operate by deactivating immune cells (for example, removing the deadly granules from NK cells), suppressing immune function (even attaching to immune cells to "blind" them), and eating up immune cells like phagocytes do.

Reliable and effective cancer prevention and treatment can be almost as elusive as accurately identifying its causes and cures. It remains the cause of more than 20 percent of deaths in the United States annually, and death percentages for some of the most common and deadly forms of cancer have remained almost unchanged for at least half a century. Cancer risks increase with age, because age leaves the body more susceptible to free radical damage and the immune system becomes increasingly ineffective.

Those at risk for cancer usually fall into three main groups: those with a family history of cancer, those who have been exposed to risk factors for cancer (ie., smokers have exposed themselves to carcinogenic chemicals in cigarettes which increases their risk of lung cancer), and those with a chronically deficient immune system (i.e., those who get 5 or more colds or other infections each year).

In fact, some experts estimate that many forms of cancer are largely preventable, with environmental factors accounting for a majority of cancer cases. Age and stress can also weaken our immunity to malignancies.

That being said, great strides in the understanding and treatment of cancer are being made daily. Traditional treatments for cancer include chemotherapy, radiation treatments and surgery, and although they are much more effective and much safer than in the past, several complications and side effects still exist.

Experts also caution us to protect ourselves from tobacco, alcohol, nitrates, pollution and even the sun. Still, cancer prevention is always the preferred choice over cancer treatment, so examining the potential of *Agaricus blazei* as a protective agent is definitely worthwhile. *Agaricus blazei* extracts help boost immune function and may even shrink existing cancerous tumors.

## 7.2. Problems with Conventional Cancer Treatments

- Weaken the body's own defenses
- Kills healthy cells, not just cancerous ones
- Surviving cancer cells can spread easier in a weakened body
- Severe side effects and potential complications

## 7.3. *Agaricus Blazei* for cancer defense

*Agaricus blazei* offers cancer protection without the same side effects and dangers of traditional cancer treatments. And because *Agaricus blazei* works with the immune system instead of compromising it, the body is healthier and better able to fight back. The two main ways in which *Agaricus blazei* offers support against cancer are *first*, *Agaricus blazei* boosts immune function, especially NK and T cell activity, so it can help prevent cancer and enhance an immune system currently fighting malignancies. *Second*, *Agaricus blazei* directly fights cancer cells.

The cancer benefits of *Agaricus blazei* appear to come from polysaccharide content (specifically beta glucans and glycoprotein compounds) and from its antioxidant power. In fact, researchers at Shizuoka University believe it is the 1,6-beta-D-glucan and protein combined that provide the best antitumor effects. But other substances may also aid its tumor-fighting abilities including: ribonucleic acid protein compounds, lectin, xyloglucan, acid heteroglucan, and natural steroids. The essential fatty acid linoleic acid also has anti-tumor potential.

Documented effects by the beta glucans found in *Agaricus blazei* on cancer include Ehrlich's ascites carcinoma, colon cancer, ovarian and breast cancers, lung cancer and liver cancer. Advancements in the treatment and prevention of ovarian, breast and prostate cancers are particularly promising, with several human studies currently underway.

Immunotherapy with *Agaricus blazei* has yielded positive results in many studies, including in vitro, in mice and in human studies. Some studies have shown that in concentrations as low as 5 percent, *Agaricus blazei* can neutralize cancer cells in as little as two days. One study examining the effects of the polysaccharides in *Agaricus blazei* against four different types of cancer cells found them effective against all four types. Notable effects from treatment included a boost in macrophage number and increased phagocytosis activity.

In one study, results showed that mice receiving daily *Agaricus blazei* treatment had three times the NK cells they started with and levels in the control group mice remained unchanged after 26 days.

Research also looked at whether *Agaricus blazei* teas prepared at lower temperatures were as effective as those prepared at higher temperatures. Researchers discovered that although *Agaricus blazei* teas were effective regardless of preparation temperature, the higher temperature version was more

effective against cancer cells. The temperature examined did not seem to affect nutritional value or immune enhancement capability.

On top of this, some research also suggests the potential of *Agaricus blazei* supplementation for those undergoing chemotherapy and radiation, since it may lessen collateral damage to healthy tissues and reduce side effects.

## **8. A QUICK GUIDE TO THE CARDIOVASCULAR SYSTEM AND HEART CONDITIONS**

The cardiovascular system is responsible for transporting nutrients and oxygen to the bodily cells, tissues and organs, as well as managing waste removal. Keeping this system operating smoothly and effectively is imperative, and failure can lead to several health conditions and ultimately death.

### **8.1. The effects of heart disease (atherosclerosis) include:**

- reduced blood vessel elasticity
- plaque buildup
- narrowing of the arteries

Over time these effects result in angina (chest pain), arterial blockages that cause heart attacks, and stroke-inducing blood clots.

It is not surprising that things can go wrong with the cardiovascular system over time. Your heart beats approximately 100,000 times a day and an average of 2.5 billion times over a lifetime. That is a lot of wear and tear over time. In fact, atherosclerosis, or heart disease, is the number one killer of both men and women, and has been for more than a century. Strokes and heart attacks account for 52 percent of deaths nationwide.

Of course, heart attacks and strokes don't happen overnight, but heart disease is a largely preventable, lifestyle disease. Despite the hereditary factor, other contributors remain in our control, including dietary habits, weight, smoking habits, stress levels and physical activity.

### **8.2. Contributors to heart disease**

High blood pressure or hypertension is one major and preventable contributor to heart disease. Hypertension affects about one-third of Americans over the age of 40 and is often the result of poor diet (especially large salt intake), stress, and lack of exercise. High blood pressure weakens blood vessel walls, making them susceptible to plaque buildup, and can also help rupture this plaque causing blood clots associated with stroke and heart attack.

Another big contributor to heart disease is cholesterol. Cholesterol can come from food sources or be manufactured in the body. It is measured in two forms: HDL cholesterol and LDL cholesterol. HDL cholesterol may be beneficial to health, but high levels of LDL cholesterol can lead to strokes and heart attacks.

Lack of exercise, poor diet, genetics are factors for high LDL levels, and oxidation of LDL cholesterol by free radicals is dangerous for the heart because it forms the plaque build-up that narrows arterial



walls. This may also explain why smokers are at higher risk for heart disease since they have more exposure to free radicals from cigarettes.

Up to 80 percent of heart attacks and strokes may be caused by bacterial infection. According to research, infections even as minor as gum disease, and related inflammation, may be a contributing factor in triggering a heart attack or stroke.

### 8.3. Cardiovascular Facts

- Cardiovascular disease is the number one killer of both men and women, and is responsible for more deaths than the next nine causes combined
- The biggest risk factors for coronary artery disease (CAD) include: obesity, high blood pressure or cholesterol, diabetes, tobacco use, and a family history of the disease
- Fourteen million Americans are currently living with CAD, and one in four are now at risk for developing the disease
- One stroke-related death occurs every three minutes
- Approximately 58 million Americans have hypertension, a leading cause of death and disability in the United States
- The deaths of half a million women a year are attributed to heart disease, more than any other medical cause, including breast cancer
- African Americans are twice as likely to suffer a heart attack or stroke

### 8.4. Agaricus Blazei for cardiovascular health

*Agaricus blazei* contains several compounds with heart-protective benefits. Among those, its dietary fiber content, beta glucan content, antioxidant potential, and linoleic acid levels.

The *beta glucan* in *Agaricus blazei* has potent anti-lipid power, which may be useful in preventing heart disease. Some studies have found that the beta glucan in *Agaricus blazei* can reduce serum levels of LDL and VLDL cholesterol by up to 40 percent and triglycerol levels by 27 percent.

*Dietary fiber* is known for its ability to promote heart health, particularly blood pressure regulation, cholesterol management and preventing atherosclerosis. Essential fatty acids like *linoleic acid* are necessary for proper blood pressure regulation. Linoleic acid regulates prostaglandin production, which is necessary for proper arterial constriction and relaxation. Essential fatty acids may also discourage blood platelet aggregation and decrease LDL cholesterol, as well as proper oxygen conduction through the circulatory system.

And of course, we can't forget about the *antioxidant potential* of *Agaricus blazei*. Cholesterol oxidation is a leading factor in the development of heart disease. Oxidation of LDL cholesterol leads to build-up on the artery walls, called atherosclerosis, which can block blood flow to the heart causing a heart attack or result in a stroke-causing clot. Antioxidants have proven heart-protective benefits.

## **9. KIDNEY AND LIVER HEALTH**

Kidney health is important for blood sugar regulation and waste removal from the body. If the kidneys aren't working properly, the health of the whole body is at risk. Physical stress, poor diet, some medications, substance abuse, and too much coffee and soft drinks can weaken the kidneys.

Studies on *Agaricus blazei* have found them useful in boosting kidney function. In a study on those with kidney failure, scientists found that an extract of the mushroom reduced blood creatinine levels. Another study designed to determine the effect of *Agaricus blazei* on levels of ammonia in the blood found that supplementing with the mushroom for a month reduced levels by more than half.

Finally a study on the use of medicinal mushrooms for the treatment of hepatitis found that in less than two months, after supplementing with an extract two to three times daily, liver enzyme levels improved.

## **10. DIGESTIVE SYSTEM**

Many potentially harmful chemicals and toxins are released into the intestines during digestion. These can then be absorbed into the body, causing damage. In fact, if you ever suffer from constipation, chances are that dangerous toxins are being absorbed by the body because you aren't eliminating waste properly. However, *Agaricus blazei* has detoxifying effects that can prevent these by-products from being absorbed into the blood, and they can help promote healthy, clean intestines.

*Agaricus blazei*'s beneficial effect on the digestive system may be due partially to its dietary fiber content, but also its digestive enzymes, specifically amylase, trypsin, maltase and protease.

In a study of the elderly with a history of diarrhea, all experienced improvement within 30 days. Most experienced improvement in digestion, more normal looking stool and less odor. Another study of college students also found improvement in mouth odor.

## **11. BLOOD SUGAR**

The blood sugar benefit of *Agaricus blazei* may be due in part to its polysaccharide content, particularly beta glucan types 1,3 and 1,6 *Agaricus blazei*'s ribonucleic acid protein compounds may also contribute to its regulatory effects.

One study on the effects of *Agaricus blazei* in diabetic rats showed that the mushroom lowered blood glucose from 450 mg/dl to 150 mg/dl. Another study out of the Institutes of Longevity Medicine found that within one week of *Agaricus* supplementation (8 percent), blood sugar was lowered by more than 11 percent.

Not only does *Agaricus blazei* show promise with normalizing blood glucose levels in those with existing diabetes, it also may help to prevent diabetes in those susceptible.

## **12. ALLERGIES AND ASTHMA**

Agaricus blazei extract shows particular promise in the treatment of allergies and was found in studies to work better than cortisone in reducing the allergic substances that are created during an asthma attack (called leucotrienes). In one study, Agaricus blazei reduced four different leucotrienes by 82 percent, compared to hydrocortisone's 69 percent. This benefit is probably attributable to Agaricus blazei's beta glucan content.

## **13. BALANCE AND ENERGIZE THE BODY**

Agaricus blazei has a detoxifying, blood purifying effect that can help rid the body of dangerous toxins and restore a healthful balance. Because of its balancing effects, Agaricus blazei is typically referred to in Traditional Chinese Medicine as an adaptogen. Adaptogens are basically substances that help the body adapt to stress by regulating body functions, such as endocrine activity. Adaptogens may raise or lower blood pressure or blood sugar in order to bring the body back into balance and boost energy levels.

In one study, animals were fed large amounts of amino acids and then Agaricus blazei. Later they were tested for the two major by-products of amino acid breakdown, and animals given Agaricus blazei had eliminated both of these by-products from the blood.

## **14. MUSHROOMS FOR HEALTHY BONES?**

The nutrient content of Agaricus blazei may also have promise in strengthening bones and reducing bone loss, particularly its calcium and vitamin D2 levels.

## **15. AGARICUS BLAZEI FOR THE SKIN?**

Topical uses of Agaricus blazei may also be helpful. Whether to offset the damage of UV exposure or heal wounds, Agaricus blazei's immune-boosting and antioxidant abilities also work topically. Rashes, blemishes, wrinkles, and other irritations or imperfections may also benefit from Agaricus treatment.

Additionally, in an NIH-sponsored 20-week mouse study, researchers from North Carolina evaluated the anti-tumor effect of an Agaricus blazei extract on skin tumors (papillomas). The researchers determined that the Agaricus extract exhibited significant inhibition of tumor initiation and promotion steps.

## **16. WHAT TYPES OF AGARICUS BLAZEI SUPPLEMENTS ARE AVAILABLE?**

Topical and oral ingestion are generally the most effective methods for Agaricus blazei supplementation. One of the most potent compounds in Agaricus blazei, its polysaccharides, requires some digestive enzyme breakdown for maximum effectiveness in the body.

The most common forms of Agaricus blazei supplements are extracts and capsules, though the mushroom may be eaten fresh or dried. For preventive use, daily consumption of around 5 grams is usually sufficient, but for treating illnesses like cancer, higher dosages of up to 40 grams may be recommended. Tea preparations are also useful, and Agaricus blazei may even be found in topical

creams. Be sure to store your Agaricus blazei supplement in an airtight container, and if you are planning to keep it for a while, refrigerate it to preserve potency.

## **17. HOW TO ENSURE YOU GET THE BEST AGARICUS BLAZEI PRODUCT**

Of course, it is very important to go to a trusted, reputable natural health manufacturer and supplier for your Agaricus blazei supplement.

Start by looking at the quality of the product that you are getting. Does the manufacturer do any scientific research on their products? What quality controls do they use and do they verify efficacy and potency? Are they involved in the growing of the Agaricus blazei and do they carefully manage the mushroom's growth environment? The efficacy of Agaricus blazei is drastically affected by the soil composition, temperature and the humidity it grows in.

Look for a company that cares about the product from the growing and processing to the manufacturing and packaging. How did they develop their formulation and what is their extraction process? Freeze drying destroys polysaccharides, so look for naturally dried products. The more information a company offers about the product and the more active their role in these decisions, the better the product is likely to be.

Also, be aware that the polysaccharide content of the Agaricus blazei can affect its efficacy.

## **18. HOW SAFE IS AGARICUS BLAZEI?**

There is no known toxicity or side effects associated with quality Agaricus blazei products. There are also no known contraindications, so it should be safe to take in conjunction with conventional treatments if desired. Rarely people are allergic to mushrooms and should use with caution. Just check with your doctor before beginning any supplement program. Studies suggest that Agaricus blazei supplementation is even safe for cancer patients undergoing chemotherapy or radiation.

## **19. COMPLIMENTARY SUPPLEMENTS**

*Sasa Bamboo Leaf Extract.* When Agaricus blazei is blended with Sasa Bamboo, the antioxidant potential of the mushroom is magnified, offering superior health promotion for maximum benefit. The rare Sasa Bamboo leaf extract has been used in Japan for hundreds of years for its preservative capabilities and powerful antioxidant potential.

*Reishi Mushrooms.* These mushrooms offer immunostimulating and antitumor effects, as well as antibacterial and antioxidant effects. They may offer benefit as well to those with HIV or liver problems and those who need to manage cholesterol levels.

*Maitake Mushrooms.* Maitake mushrooms regulate blood sugar and blood pressure, and show promise in cancer treatment. They may also protect the liver.

*Shiitake Mushrooms.* Provide help for the liver, the urinary tract, the immune system, and the lungs. They offer blood pressure control and cholesterol management help.

## 20. CONCLUSION

Research shows that the right nutritional supplementation can make a significant difference in overall health and quality of life.

We live in a toxic environment. Every day we come in contact with factors that have the potential to negatively affect health and contribute to chronic diseases and even death. Traditional healthcare has failed to provide answers. In response to today's growing health problems and the troubling failures of modern medicine to effectively respond, many concerned individuals have turned to nutritional supplementation and alternative health care for answers.

Overall wellness and disease prevention require not just a good diet and healthy lifestyle, but also additional protection in the form of a nutritional supplement with immune-boosting potential and a balanced phytonutrient and antioxidant profile. The right nutritional supplement, like *Agaricus blazei*, can make a significant difference in overall health and quality of life.

Many are discovering the potential benefits of the little fungus from South America, which may hold the key to preventing disease, slowing the aging process and promoting overall health and long life. In the coming years, the potential of *Agaricus blazei* in health and wellness may only become more apparent as medical science fully realizes the truth of ancient wisdom.

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