Agaricus Bisporus SAP

Science-based immune support for optimal health

Agaricus Bisporus SAP is a hot water–extract from white button mushroom (WBM; *Agaricus bisporus*), the most commonly consumed mushroom in North America and most Western countries. *A. bisporus* constitutes of a significant amount of vitamin D precursor ergosterol, dietary fibres, and antioxidants including vitamins C, B_{12}, folates, and polyphenols. In addition, lectins from *A. bisporus* exert various beneficial effects including their role in improving the chemotherapeutic efficacy of cancer treatments, and their ability in inhibiting colon cancer–cell proliferation and enhancing the cellular antioxidant defense mechanisms. As a potent aromatase inhibitor and immunomodulatory agent in increasing natural killer-cell activity and promoting adaptive immune responses, *A. bisporus* extracts have gained recent attention for their potential value in breast and prostate cancer support. Also, studies support the application of *A. bisporus* extracts in type 2 diabetes, metabolic syndrome, cholesterol management, and cardiovascular disease (CVD). Early-stage preclinical evidence suggests the physiological benefits of *A. bisporus* in improving working memory and balance during aging. **Agaricus Bisporus SAP** can be used as an adjunctive support in the treatments of cancers, diabetes, and cholesterol management, as well as in CVD risk alleviation.

ACTIVE INGREDIENTS

Each capsule contains:

Agaricus bisporus 5:1 extract,
30% polysaccharides providing 15% β-glucans . . . . . 667 mg

NON-MEDICINAL INGREDIENTS: Vegetable magnesium stearate and silicon dioxide in a capsule made of vegetable carbohydrate gum and purified water.

Contains no: Gluten, soy, wheat, corn, eggs, dairy, yeast, citrus, preservatives, artificial flavour or colour, starch, or sugar.

This product is non-GMO and vegan friendly.

Agaricus Bisporus SAP contains 90 capsules per bottle.

DIRECTIONS FOR USE

Adults: Take 3 capsules daily or as directed by your healthcare practitioner.

INDICATIONS

Agaricus Bisporus SAP is a source of antioxidants, and can be used as an adjunctive support in breast, prostate, ovary, and colon cancer therapy, and can help:

- Promote healthy inflammatory responses.
- Support healthy immunomodulation.
- With the management of cholesterol and type 2 diabetes, and alleviate CVD risk factors.
- Improve aging-associated loss in working memory and balance.

CAUTIONS AND WARNINGS

Consult a healthcare practitioner prior to use if you are pregnant or breast-feeding, or if you have diabetes. Do not use if seal is broken. Keep out of reach of children.

PURITY, CLEANLINESS, AND STABILITY

All ingredients listed for each product lot number of **Agaricus Bisporus SAP** have been tested by an ISO 17025–accredited third-party laboratory for identity, potency, and purity.

Scientific Advisory Panel (SAP): adding nutraceutical research to achieve optimum health

NFH®

351, Rue Joseph-Carrier, Vaudreuil-Dorion, Quebec, J7V 5V5
T 1 866 510 3123 • F 1 866 510 3130 • nfh.ca

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INTRODUCTION

Agaricus bisporus is the most commonly consumed mushroom in North America and most Western countries.[1] *A. bisporus* constitutes of a significant amount of vitamin D precursor, ergosterol, which usually when exposed to ultraviolet irradiation results in vitamin D_2. *A. bisporus* contains lectins that have been shown to improve the efficacy of chemotherapeutic treatments by increasing the sensitivity of lung, colon, and glioblastoma cancerous cells to the treatment.[2][3] Studies have also demonstrated the ability of lectins from *A. bisporus* in inhibiting colon cancer–cell proliferation and enhancing the cellular antioxidant defense mechanisms.[2][3]

IMMUNOMODULATION

Innate and adaptive immunity are two different yet closely linked components of the immune system. Innate immune response is a fully functional first-line defense system in fighting against invading microorganisms, while the adaptive immunity, i.e. cell-mediated and humoral immunity, ensures a more efficient and sustained response in fighting these invading microorganisms by developing a memory to prevent future infections by the same microorganisms. Antigen-presenting cells (APC) represent an important link between these two components that functions by recognizing, taking up, processing, and eventually presenting a variety of foreign antigens to T cells to initiate the adaptive immune response. The dendritic cells (DC), macrophages, and B cells are three crucial professional APC.[4][5][6][7][8]

Dietary supplementation of *A. bisporus* has been shown to increase natural killer-cell activity,[9][10] and to promote antigen-presenting function and maturation of DC.[11] In one randomized, controlled clinical study with 24 healthy volunteers, participants consuming a normal diet with 100 g of blanched *A. bisporus* showed significant increases in salivary secretory IgA (sIgA) levels compared to those consuming the normal diet without *A. bisporus*.[12]

CANCER

Substantial evidence shows that *A. bisporus* extracts have beneficial effects on various kinds of cancers.

Breast Cancer

One of the major factors in the development of breast cancer is estrogen. Especially, estrogen production by aromatase/estrogen synthetase in breast cancer is related to increased tumour proliferation.[13] *A. bisporus* extracts have been shown to inhibit aromatase activity effectively, particularly in an aromatase-transfected breast cancer–cell line, and suppress breast cancer–cell proliferation.[13] Another study in mice showed that *A. bisporus* extracts decreased breast cancer tumour weight and cell proliferation without affecting the rate of apoptosis.[14] Conjugated linoleic acid and its derivatives are considered to be the physiologically relevant aromatase inhibitors in *A. bisporus* extracts.[14] In addition, microarray analysis of tumours in *A. bisporus* extract–fed mice displayed significant changes in gene expression, especially gene networks that are involved in cell death, growth, and proliferation; lipid metabolism; the tricarboxylic acid cycle; and immune response.[13][14]. One early-stage clinical study in postmenopausal breast-cancer survivors who were cancer-free after completion of cancer therapy has lent clinical evidence on the breast cancer–preventive role of *A. bisporus* extracts.[15] In this study, groups were supplemented with a 12-week course of *A. bisporus* extract at 5, 8, 10, or 13 g doses. The study results showed a modest aromatase inhibition, and *A. bisporus* extract was well-tolerated at all doses.[15] The findings of this study suggest the need for a much higher dosage to attain a clinically significant effect. Hence, more clinical studies using *A. bisporus* extracts are warranted to validate the preclinical and early-pilot clinical studies.

Prostate Cancer

Serum prostate-specific antigen (PSA) is a useful biomarker for the diagnosis of organ-confined prostate cancer.[16] A small elevation in PSA level (≥ 0.2 ng/mL) is often considered a sign of persistent disease, usually correlated to subsequent disease progression.[17] In a recent phase I clinical study, patients with continuously rising PSA levels were enrolled with the primary objective of testing the treatment effects of *A. bisporus* extracts and associated toxicity.[1] In addition, the study evaluated the effect of *A. bisporus* extract on serum PSA/androgen levels, myeloid-derived suppressor cells (MDSCs), and cytokine levels.[1] The study results demonstrated an overall PSA response rate of 11%, and two patients receiving 8 and 14 g/d of *A. bisporus* extract showed complete response (PSA declined to undetectable levels that continued for 49 and 30 months). Two more patients who received 8 and 12 g/d experienced partial response. Patients with complete and partial response also displayed higher baseline levels of IL-15 than nonresponders, where a decline in MDSC was observed.[1] This study suggests that *A. bisporus* extracts could be a valuable therapeutic option for the treatment of biochemically recurrent prostate cancer.

Ovarian Cancer

Ovarian cancer, a common gynecological malignancy, is predominantly epithelial in origin.[18] In a hospital-based case-control study that investigated the association between mushroom consumption and epithelial ovarian cancer risk in Southern Chinese women, mushroom intake, particularly *A. bisporus* intake, was shown to be inversely related to cancer risk.[18]

DIABETES AND LIPID/CHOLESTEROL METABOLISM

A. bisporus contains high levels of dietary fibees and antioxidants, including vitamins C, D, and B_{12}; folates; and polyphenols that could be beneficial for cardiovascular diseases and diabetes.[19] In an animal study, rats fed *A. bisporus* powder for three weeks showed significant reductions in plasma glucose and triglyceride (TG) levels, liver enzyme activities, and liver weight gain.[20] Especially in diet-induced hypercholesterolemic rats, *A. bisporus* supplementation for four weeks resulted in a significant decrease in plasma total cholesterol and low-density lipoprotein cholesterol, hepatic cholesterol, and TG levels, with a simultaneous increase in plasma high-density lipoprotein levels.[19] A recent retrospective study determined the impact of *A. bisporus* consumption on type 2 diabetes risk factors in 37 racially diverse adults with metabolic syndrome.[20] The subjects studied had participated in a dietary intervention focused on vitamin D bioavailability from *A. bisporus* (100 g/d). The study showed significant beneficial health effects at 16 weeks, including elevation in the antioxidant marker ORAC (oxygen radical absorption capacity) and adiponectin, and significant decreases in serum oxidative stress–inducing factors carboxymethyllysine and methylglyoxal.[20] However, more well-controlled studies are required to validate and confirm these research outcomes.

Ergosterol-enriched extracts from *A. bisporus* have been to shown to lower hepatic triglyceride and modify the mRNA expression of cholesterol-related genes.[21] In another study, researchers observed up to 60% inhibition of HMGCR from methanol-water *A. bisporus* extracts using an in vitro assay.[22]

BALANCE AND WORKING MEMORY

The potential benefits of *A. bisporus* supplementation in aging and balance was explored in a recent animal study.[23] This study investigated the effects of dietary mushroom intervention on mobility and memory in aged rats. Rats on the 2% or 5% mushroom-supplemented diet for eight weeks consumed more food, without gaining weight, than rats in the other diet groups. In addition, these rats showed an improvement in balance.[23] Rats on the 0.5% mushroom diet showed improved performance in a working-memory version of the Morris water-maze. The study results suggested that the most effective mushroom dose that produced improvements in both balance and working memory was 0.5%, equivalent to about 1.5 ounces of fresh mushrooms for humans. Although human clinical evidence is required to confirm these findings, the results suggest potential beneficial effects on age-related deficits in cognitive and motor function.[23]

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