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A case–control study on the dietary intake of mushrooms and breast cancer risk among Korean women

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A total of 362 women between the ages of 30 and 65 years who were histologically confirmed to have breast cancer were matched to controls by age (± 2 years). The associations between the daily intake of *shiitake* mushroom with breast cancer risk were evaluated using matched data analysis as below:

- Age
- Menopausal status
- Body mass index
- Family history of breast cancer
- Current smoker
- Regular exercise
- parity
- Oral contraceptive use
- Used hormone compound
- Age at menarche
- Age at first birth
- Age at menopause
- Dietary intake of Energy
- Dietary intake of Folate
- Dietary intake of Vitamin E
- Dietary intake of Total vegetables
- Dietary intake of Total fruits

after adjusting for above items, a strong inverse association was found between *shiitake* mushroom intake and breast cancer risk.

Immune shiitake® as aromatase inhibitor can be used:

- In pre- and postmenopausal women in order to reduce the risk of breast cancer
- In women who have a high risk of breast cancer
- In women with ER-positive breast tumors before and after surgery
- In women who have recovered from breast cancer in order to reduce the risk of breast cancer coming back or spreading
- In reproductive age women for ovulation induction

Side Effects: Orally, shiitake mushroom can cause abdominal discomfort, eosinophilia, “*shiitake*” dermatitis, and possibly photosensitivity.

Warning: Do not use if you are allergic to mushrooms, pregnant or breast feeding. Contraindicated in patients with eosinophilia.

References:

1. Journal of Nutrition. 2002, 131(12):3288-93
2. Cancer Res. 2006, 66(24): 12026-12034
3. J Steroid Biochem Mol Biol. 2007, 106(1-5): 81–96



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Extract of the *shiitake* Medicinal Mushroom

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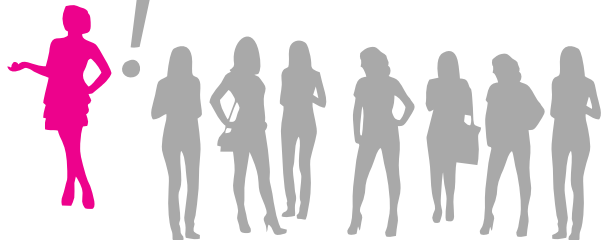


Natural prevention of breast cancer through aromatase inhibitor with immune shiitake®



1 in 8

Women will be diagnosed with breast cancer in their life time



Immune Shiitake® is an important natural constituent for reducing the incidence of hormone-dependent breast cancer in women.



Risk factors for breast cancer



Major bioactive compounds in *shiitake* extract

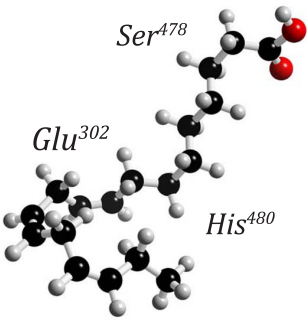
Name of substance	Nutrient category	Function
Lentinan	Specific member of the beta-glucan polysaccharides	Immunomodulatory
Linolenic acid and Linoleic acid	Essential Fatty acids	Aromatase inhibitors

Immune shiitake® is significantly associated with a decreased risk of breast cancer in both pre- and postmenopausal women.



Anti-Aromatase activity of Mycochemical in shiitake mushroom

- Linolenic acid as a noncompetitive inhibitor interacts with aromatase at the active site region, with His⁴⁸⁰, Ser⁴⁷⁸, and Glu³⁰² proving to be important to this interaction.¹
- A feedback mechanism involving fatty acids by medicinal mushrooms could be responsible for the down-regulation of aromatase expression or suppression of aromatase activity.²



The important pathologic roles of extra ovarian (peripheral) and local estrogen biosynthesis in an estrogen-dependent disease in postmenopausal women

- The female hormone estrogen plays a critical role in breast cancer development.
- Suppression of estrogen formation by aromatase inhibitors may be a useful prevention/treatment strategy for breast cancer.³

