THE BERRY DOCTOR'S JOURNAL
SCIENCE - NUTRITION - HEALTH

Weekly News from Berry Science

Black Raspberries at the Forefront of Cancer Research

[follow the Wikipedia links]

What You'll Find in this issue of the Berry Doctor's Journal

1. laboratory studies of cancer onset mechanisms show altered gene activity is a trigger
2. in rats, dietary supplementation with black raspberries restored normal activity in 20% of the genes affected by a cancer stimulus
3. polyphenol antioxidants, such as cyanidin glucosides rich in black raspberries, probably do not act alone to inhibit cancer effects on genes
4. other foods and food components in berries -- essential nutrients and dietary fiber -- may act in synergy with polyphenols to inhibit cancer mechanisms

Source

Black raspberries show potential against cancer, by Stephen Daniells, NutraIngredients.com-Europe, August 28, 2008.

Published in: Cancer Research
August 1, 2008
Volume 68, Pages 6460-6467

G.D. Stoner et al.
Carcinogen-Altered Genes in Rat Esophagus Positively Modulated to Normal Levels of Expression by Both Black Raspberries and Phenylethyl Isothiocyanate

One of the most powerful laboratory tools in the fight against cancer is to measure gene sensitivity ("gene expression") in affected organs.

This is like a rapid litmus test for detecting anti-cancer activity of agents like polyphenols from black raspberries.

Black raspberries may help
prevent certain cancers by acting
on multiple gene targets
(click for the research abstract)

Over 2,000 genes were affected in the esophagus of animals when they were exposed to a carcinogen, but normal function was restored in 20% of these genes after supplementation with freeze-dried black raspberries, researchers from Ohio State University report.

"*We have clearly shown that berries, which contain a variety of anticancer compounds, have a genome-wide effect on the expression of genes involved in cancer development,*" said lead researcher Dr. Gary Stoner.

"*This suggests to us that a mixture of preventive agents, which berries provide, may more effectively prevent cancer than a single agent that targets only one or a few genes.*"

Black raspberries (*Rubus occidentalis* L.)
at different stages of ripening (black is ripe)

The researcher added that black raspberries contain many different types of nutrients, including vitamins, minerals, phenols and phytosterols, many of which individually have been reported to prevent cancer in animals.

The Ohio State researchers fed rats a standard diet (control group) or a diet supplemented with black raspberry powder. After three weeks, the rats were exposed to a compound known to cause cancer. This led to a change in 2,261 genes.

Some of the cancer onset mechanisms associated with changes in gene expression in this experiment included

- cancer cell proliferation -- inhibited by black raspberries
- inflammation -- inhibited by black raspberries
- increased apoptosis (rate of natural cell death) -- stimulated by black raspberries

However, in the animals fed the black raspberry powder, 20% of the genes showed near-normal levels of activity, compared with controls.

"What's emerging from studies in cancer prevention is that using single compounds alone is not enough," he added.

“Berries are not enough.
We never get 100 percent
tumor inhibition with berries."

"So we need to think about another food
that we can add to them that will boost
the anti-cancer activities of berries.”

What is the take-home message for consumers?

1. black raspberries are a phenolic-rich fruit also containing other nutrients of potential value as dietary agents against cancer onset mechanisms

2. black raspberries or products from them are not commonly available and are not the only sources of the antioxidants or nutrients needed as cancer-fighting agents

3. these compounds are readily available in color-rich whole fruits and vegetables inexpensive in your grocery store

4. eat a diet of different plant food colors -- the Color Code -- to give yourself the advantage of nutrient synergy in cancer prevention

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