



# Dietary Flavonoids for the Prevention of Colorectal Cancer

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## Objective

To assess whether dietary flavonoids have an effect on the incidence of colorectal adenoma and colorectal cancer.

## Type of Review

A review of eight studies where meta-analysis was undertaken when possible.

## Relevance to Nursing

Colorectal cancer is one of the most common forms of cancer. The main risk factors associated with the development of colorectal cancer are diet and lifestyle. Those risk factors offer opportunities for prevention because of the potential for modification. Evidence suggests that a diet rich in fruits and vegetables is associated with a reduced risk of colorectal cancer, in part because they contain flavonoids. Flavonoids are a group of more than 5,000 polyphenolic compounds found in food and beverages of plant origin. In animal studies, they have been shown to have an antioxidant effect, interfere with or eliminate carcinogens, inhibit cell proliferation, induce apoptosis, and inhibit angiogenesis. Flavonoids could have preventive effects against several cancers, particularly colorectal neoplasms. Reviewing the best available evidence surrounding the effectiveness of flavonoids in the prevention of colorectal cancer adds to the knowledge that nurses can use to support patients making dietary modifications.

## Characteristics of the Evidence

The review included eight studies and involved 390,769 participants. One study was a randomized, controlled trial, and

the remaining seven were observational studies (five prospective cohort studies and two retrospective case-control studies). Four of the studies were from the United States, two from Japan, one from the Netherlands, and one from Scotland. Participants included adults with colorectal adenomas and with or without colorectal cancer from any age group or setting.

The studies investigated the association between flavonoid intake and risk of colorectal cancer or colorectal adenoma recurrence. The outcomes of interest were the incidence of colorectal cancer or adenomas and their association with dietary flavonoids as well as the incidence of colorectal cancer and adenomas in different subgroups of dietary flavonoids at different doses and durations. The classes of flavonoids examined included total flavonoid (four studies), isoflavones (two studies), individual flavonoids of isoflavones (one study), flavonols (three studies), individual flavonoids of flavonols (three studies), flavones (three studies), flavan-3-ols (two studies), individual flavonoids of flavan-3-ols (two studies), procyanidins (one study), flavonones (two studies), phytoestrogens (one study), and anthocyanins (one study).

Follow-up spanned from 3–13 years. The methodologic quality was assessed as high in three of the prospective cohort studies and medium in the two remaining prospective cohort studies as well as the two case-controlled studies. Methodologic quality of the one randomized, controlled trial showed a high risk of selection, attrition, and reporting bias.

## Summary of Key Evidence

The results suggest that some flavonoid subclasses and individual flavonoids could have an effect on preventing the development of colorectal cancer and colorectal neoplasms and the recurrence of colorectal adenomas.

A statistically significant decrease in the incidence of colorectal cancer and colorectal neoplasms was observed in flavonols (two studies), epicatechin (one study), procyanidins (one study), and total flavonones (two studies). A slight decrease was observed in quercetin (two studies), flavan-3-ols (two studies), catechin (two studies), hesperidin (two studies), naringenin (two studies), and phytoestrogen (one study).

A statistically significant decrease in the incidence of colorectal adenoma recurrence was found with biochanin A (one study), formononetin (one study), genistein (one study), and daidzein (one study). A slight decrease was noted with kaempferol (one study), myricetin (one study), flavones (one study), and flavan-3-ols (two studies).

No statistically significant difference was found in the combined results of total flavonoids between the highest and lowest flavonoid intake and the prevention of colorectal neoplasms in three studies. The randomized, controlled trial showed no association between total flavonoid intake and the risk of adenoma recurrence.

Although the methodologic quality of the studies was medium to high, the use of observational studies, self-administered questionnaires, and estimates of flavonoid

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