# Modified Fiber Diets

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# Modified Fiber Diet

- **High Fiber Diet**
- **Low fiber Diet**

# Quick Facts on Fiber?

- Also known as complex carbohydrates. Fibre is a type of carbohydrate that the body cannot break down and so it passes through our gut into our large intestine (or colon).

- There are many classifications; solubility and fermintablility

- **Water soluble/ fermented:** which dissolves in water, form gel-like substance.

- **Insoluble fiber/less fermented:** which does not dissolve in water, can't be digested by intestinal bacteria (speeds up the flow of substance in the GI).

# Quick Facts on Fiber?

**Table 1** Classification of dietary fibre components based on water solubility/fermentability

| Characteristic | Fibre component | Description | Main food sources |
|---|---|---|---|
| Water insoluble/ Less fermented | Cellulose | Main structural component of plant cell wall. Insoluble in concentrated alkali, soluble in concentrated acid. | Plants (vegetables, sugar beet, various brans) |
| | Hemicellulose | Cell wall polysaccharides, which contain backbone of β-1,4 glucosidic linkages. Soluble in dilute alkali. | Cereal grains |
| | Lignin | Non-carbohydrate cell wall component. Complex cross-linked phenyl propane polymer. Resists bacterial degradation. | Woody plants |
| Water soluble/ Well fermented | Pectin | Components of primary cell wall with D-galacturonic acid as principal components. Generally water soluble and gel forming | Fruits, vegetables, legumes, sugar beet, potato |
| | Gums | Secreted at site of plant injury by specialized secretary cells. Food and pharmaceutical use. | Leguminous seed plants (guar, locust bean), seaweed extracts (carrageenan, alginates), microbial gums (xanthan, gellan) |
| | Mucilages | Synthesized by plant, prevent desiccation of seed endosperm. Food industry use, hydrophilic, stabilizer. | Plant extracts (gum acacia, gum karaya, gum tragacanth) |

# Quick Facts on Fiber?

- **Soluble fiber:**

- Can help lower glucose levels as well as help lower blood cholesterol
- How? Bind to cholesterol and form a bulk.
- Also, fiber bind to the bile acid, thus the body will use more cholesterol, thus reducing cholesterol in the blood.

- **Insoluble fiber:**

- can help food move through your digestive system, promoting regularity and helping prevent constipation.

# Fiber Types

- **Examples:**
- **Soluble Fiber**: oatmeal, chia seeds, nuts, beans, lentils.

- **Insoluble fiber**: whole grains, brown rice nuts, fruit skins and vegetables like broccoli.

- Does the Fiber consider a functional food?

# Fiber and Colorectal Cancer

## Fiber Intake and Incidence of Colorectal Cancer among 76,947 Women and 47,279 Men

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### Abstract

**Prospective cohort studies have consistently found no important link between fiber intake and risk of colorectal cancer. The recent large, prospective European Prospective Investigation into Cancer and Nutrition has challenged this paradigm by suggesting significant protection by high fiber intake. We prospectively investigated the association of fiber intake with the incidence of colon and rectal cancers in two large cohorts: the Nurses' Health Study (76,947 women) and the Health Professionals Follow-up Study (47,279 men). Diet was assessed repeatedly in 1984, 1986, 1990, and 1994 among women and in 1986, 1990, and 1994 among men. The incidence of cancer of the colon and rectum was ascertained up to the year 2000. Relative risk estimates were calculated using a Cox proportional hazards model simultaneously controlling for potential confounding variables. During follow-up including 1.8 million person-years and 1,596 cases of colorectal cancer, we found little association with fiber intake after controlling for confounding variables. The hazard ratio for a 5-g/d increase in fiber intake was 0.91 (95% confidence interval, 0.87-0.95) after adjusting for covariates used in the European Prospective Investigation into Cancer and Nutrition study and 0.99 (95% confidence interval, 0.95-1.04) after adjusting for additional confounding variables. Our data from two large prospective cohorts with long follow-up and repeated assessment of fiber intake and of a large number of potential confounding variables do not indicate an important association between fiber intake and colorectal cancer but reveal considerable confounding by other dietary and lifestyle factors.** (Cancer Epidemiol Biomarkers Prev 2005;14(4):842–9)

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### Introduction

# Fiber and Colorectal Cancer

**Is the Association with Fiber from Foods in Colorectal Cancer Confounded by Folate Intake?**


## Abstract

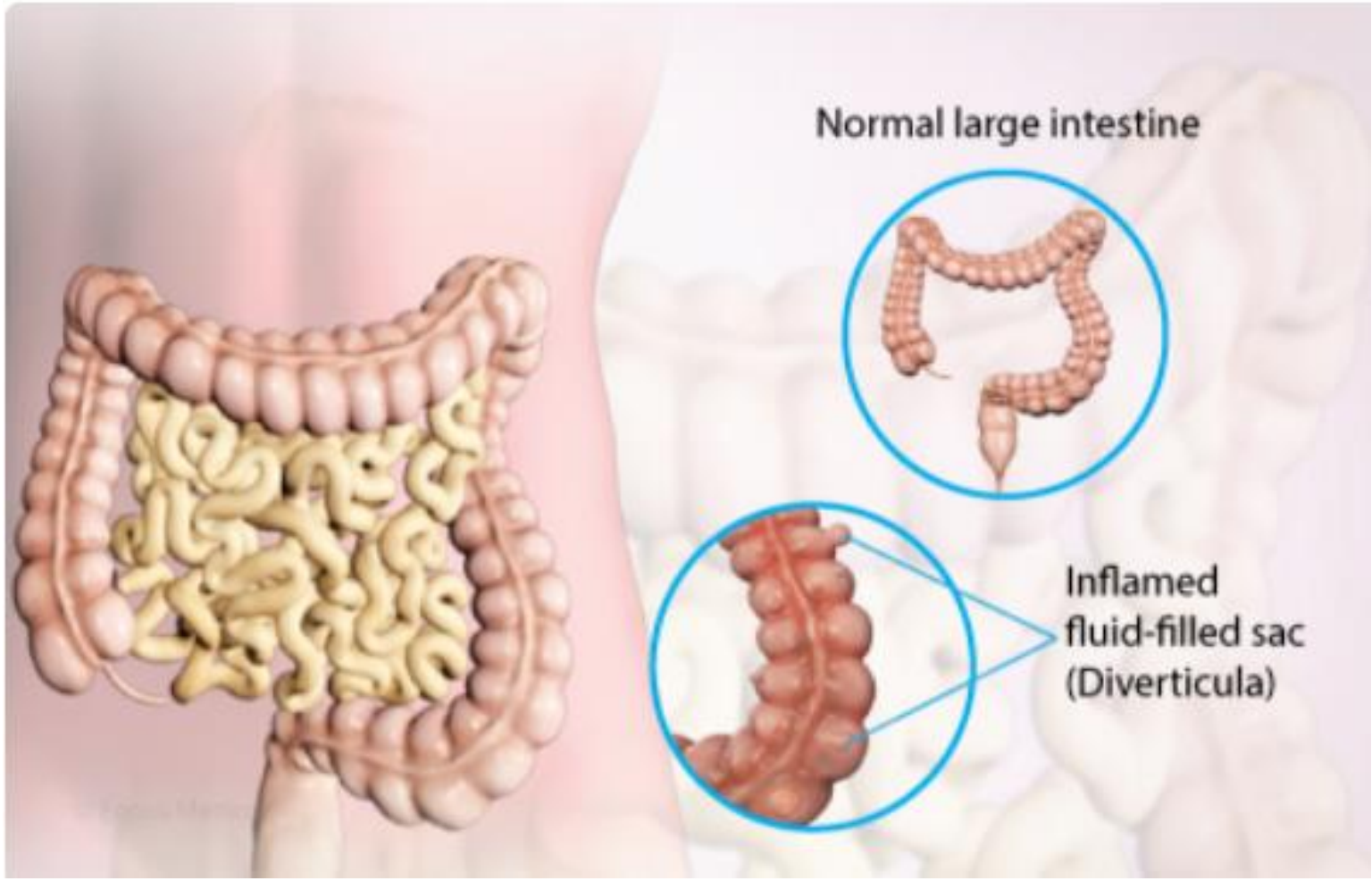
The effect of multivariate adjustment including folate on the strong protective effect of fiber in foods on colorectal cancer risk in the European Prospective Investigation into Cancer and Nutrition was investigated in 1,721 cases identified in the latest follow-up. The inclusion of an additional 656 cases confirmed our previously published results, with a strong and significant reduction in colorectal cancer risk of ~9% for each uncalibrated quintile increase in fiber ($P_{\text{linear trend}} < 0.001$) compared with an 8% reduction in our previous report, which had not been adjusted for folate. Inclusion of the other covariates (physical activity, alcohol, smoking, and red and processed meat) confirmed this significant inverse association for colon cancer and strengthened the association with left-sided colon cancer ($P < 0.001$). After maximum adjustment, the association between fiber and rectal cancer was not significant, as in our previous analysis. The association with fiber from different food sources was analyzed, but again, there were no significance trends after maximum adjustment. (Cancer Epidemiol Biomarkers Prev 2005;14(6):1552–6)

# High Fiber Diets

- **Use;** The High Fiber Diet is useful in the treatment of many of the diseases such as:

- Obesity, increase the fullness
- Cardiovascular disease, lower cholesterol
- Type 2 diabetes/ lower blood glucose
- less prevalent but no less significant diagnoses of **colonic diverticulosis** and **constipation**.
- These conditions can be prevented or treated by increasing the amounts and varieties of fiber-containing foods.

# Colonic diverticulosis



# Colonic diverticulosis

- **Definition**: An inflammation or infection of the pouches formed in the colon.
- **Cause:** The exact cause is not known. Due to lack of fiber intake in the food, stool becomes harder and it makes it difficult to move in the colon. This leads to pressure on the pouch.
- **Diagnosis:** Diverticulitis is usually diagnosed during an acute attack.
- **Treatment:** Antibiotics and over-the-counter painkillers are available to treat diverticulitis.

# High Fiber Diets

- **Adequacy**

- A diet higher in fiber is likely to be less calorically dense and have a higher satiety value than a diet lower in fiber.

- The suggested food plan provides foods in amounts that will provide the Dietary Reference Intakes (DRIs).

# High Fiber Diets

- **Diet Principles**

- The High Fiber Diet contributes 25–30 grams of dietary fiber.
- Increased fiber intake should come from a variety of food sources rather than from fiber supplements to ensure adequate nutrient intake.
- High dietary fiber foods should be added gradually to prevent possible short-term side effects including abdominal discomfort, bloating, cramping, or diarrhea. If symptoms continue, reduce fiber intake.

# High Fiber Diet

- A high fiber diet should be accompanied by a liberal intake of water or other fluids. Because fiber holds water, thereby softening the stool, at least 8 cups of liquids should be ingested daily.

- Inadequate fluid can lead to constipation or impaction in the colon because dietary fiber absorbs water from the intestinal tract.
- Decreases the absorption of some minerals such as iron and zinc
- Dietary fiber Vs. fiber supplement

# Low Fiber Diet

- **Use**: The Low Fiber Diet is designed for use in patients receiving radiation therapy on or near the intestine.
- Partial bowel obstruction.
- in periods of disease flares or intestinal strictures in inflammatory bowel disease e.g. Crohn's disease or Ulcerative colitis.
- Diverticulitis.
- Long-term use of this diet is discouraged because it may contribute to constipation
- **Adequacy**: Adequacy The suggested food plan provides foods in amounts that will provide the DRIs.

# Low Fiber Diet

- **Diet Principles:**

- The diet includes foods that will reduce frequency and volume of stools.
- It is smooth in texture and is mechanically and chemically nonirritating.
- Food tolerances vary greatly and patients should be encouraged to eat the most liberal diet possible and include adequate fluids.