

Dry Bean Consumption Inhibits Colorectal Tumorigenesis in Preclinical Studies: A Meta-Analysis of Animal Studies**[FONT SIZE 11, BOLD, CALIBRI]**M.L.D. Author¹, A. Author², N. Author³, P. Author⁴, and T.Author⁵

Chemo-protective effect of dry beans against colorectal tumorigenesis in humans has been proposed, but the number of studies examining this effect is limited. To evaluate whether further human studies are warranted, we conducted a meta-analysis of preclinical studies in animals examining the relation between dry bean consumption and colorectal tumorigenesis. Ten preclinical studies were included in the meta-analysis to evaluate the effect of consumption of whole dry beans and dry bean fractions (fiber fractions, ethanol extract, and ethanol extract residue) at varying concentrations of the diet (10-75% of dry beans of the overall diet) on colorectal tumorigenesis. Tumor endpoints were incidence and multiplicity of adenocarcinoma, adenoma + adenocarcinoma, tumor, or aberrant crypt foci (ACF; only multiplicity). Risk estimates for tumors, comparing cancer-induced rats (n=277) and mice (n=53) consuming dry beans versus cancer-induced rats (n=173) and mice (n=52) consuming a control diet, all of which were male, were calculated using pooled risk ratios (RR) and 95% confidence intervals (CI) through a random-effects model in STATA. For calculating risk estimates of tumor and ACF multiplicity, we calculated standardized mean differences and variation from reported means and standard errors. Cancer-induced male rats or mice consuming dry beans had a lower colorectal tumor risk than those consuming control diet: colorectal adenocarcinoma incidence (RR=0.38; 95% CI: 0.20-0.74) and multiplicity (RR=0.52; 95% CI: 0.27-0.98), combined adenoma + adenocarcinoma incidence (RR=0.25; 95% CI: 0.16-0.40) and multiplicity (RR=0.52; 95% CI: 0.31-0.89), tumor incidence (RR=0.21; 95% CI: 0.11-0.43) and multiplicity (RR=0.24; 95% CI: 0.16-0.36), and ACF multiplicity (RR=0.11; 95% CI: 0.04-0.27). Dry bean consumption inhibits colorectal tumorigenesis in male animal models of human CRC. However, long-term dry bean CRC prevention intervention studies in humans are warranted to further elucidate the effects of daily dry bean consumption on different stages of colorectal tumorigenesis.

[FONT SIZE IS 10, CALIBRI, LINE SPACING IS 1, WORD COUNT 300]**Keywords:** Dry beans, Colorectal tumorigenesis, Adenocarcinoma, Meta-analyses, Animal studies.**[ARRANGED IN ALPHABETICAL ORDER, MAXIMUM OF FIVE]**

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