

Diets Containing Whey Proteins or Soy Protein Isolate Protect against 7,12-Dimethylbenz(*a*)anthracene-induced Mammary Tumors in Female Rats¹

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Abstract

A study was conducted to determine the protective effects of two common dietary proteins, soy protein isolate (soy) and bovine whey, against chemically induced mammary tumors in female Sprague Dawley rats. Rats were fed AIN-93G diets having casein, soy, or whey as the sole protein source. Rats within the same dietary groups were mated to obtain the F₁ and F₂ generations. At age 50 days, F₁ (experiment A) or F₂ (experiment B) female offspring (≥ 19 rats/group) were p.o. gavaged with 80 mg/kg 7,12-dimethylbenz(*a*)anthracene, and mammary glands were evaluated when 100% of the casein-fed group developed at least one palpable tumor. Rats grew well on all three diets, but casein-fed rats gained slightly more body weight than soy- or whey-fed rats ($P < 0.05$). Vaginal opening occurred 1 day earlier in soy-fed rats than in casein- or whey-fed rats, but no other differences in reproductive and developmental parameters were observed between groups. When 50% of the casein-fed rats had at least one mammary tumor, lower tumor incidences (24–34%) were observed in the soy-fed ($P < 0.009$) and whey-fed groups ($P < 0.001$). When 100% of the casein-fed rats had at least one tumor, soy-fed rats had a lower tumor incidence (77%) in experiment B ($P < 0.002$), but not in experiment A ($P < 0.12$), and there were no differences in tumor multiplicity. Whey-fed rats had lower mammary tumor incidence (54–62%; $P < 0.002$) and multiplicity ($P < 0.007$) than casein-fed rats in both experiments. Our results indicate that diets rich in soy reduce the incidence of chemically induced mammary tumors by approximately 20%. Furthermore, whey appears to be at least twice as effective as soy in reducing both tumor incidence and multiplicity.