# The Role of Some Food Habits on Cancer

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The causal relationships between the disease and the risk factors are generally identified in Epidemiology. In human being, there is a strong association between an increased risk of developing cancer and blood plasma concentrations of beta-carotene, retinol, or other carotenoids [1-4]. It is reported in some research articles that a smaller retinol levels may be a consequence of rather than a cause of invasive cancer [2]. Some research reports have derived the determinants of human blood plasma levels of beta-carotene and retinol [1,4,5], and some articles have also reported that some dietary factors have a high correlation with the plasma carotene levels [6-8]. For example, supplemental vitamin intake, or more dietary intake of yellow and green leafy vegetables generally increases plasma beta-carotene levels [3,4,9-11], while smoking cigarettes and consumption of alcohol decrease beta-carotene levels [12]. In cancer research, it is known that low plasma concentrations of carotenoid levels are significantly associated to the development of cancer. The present report focuses the effect of some dietary factors such as supplemental vitamin intake, fat, fiber, calories, cholesterol, dietary beta-carotene consumption, dietary retinol consumption, alcohol consumption, and smoking cigarettes on blood plasma concentrations of beta-carotene and retinol. The report aims to examine the following hypotheses. Out of the above dietary factors, which are the protective or risk factors of cancer? Based on a real data set displayed in [5], the above hypotheses are examined.

The considered plasma data set is given in [5] which contains 315 subjects with 14 variables (3 attributes and 11 variables). The data set can be found at the site: http://biostat.mc.vanderbilt.edu/twiki/bin/view/Main/DataSets?CGISESSID=10713f6d891653ddcbb 7ddbdd9cffb79. The study subjects are some cancer patients such as ovary (or uterus), lung, breast, colon and skin. The data frame was constructed by Hong Yu, a graduate student at the University of Virginia, December14, 2002. The three attribute characters are sex (male = 0, female = 1) (SEX), smoking status (0 = never, 1 = former, 2 = current smoker) (SMOKSTAT), vitamin use (0 = yes, fairly often, 1 = yes, not often, 2 = no) (vituse). The remaining 11 variables are age, quetelet (weight/ height 2) (quetelet), calories consumed (number per day) (calories), fat consumed (gm per day) (fat), fiber consumed (gm per day) (fiber), alcoholic drinks consumed per week (alcohol), cholesterol consumed (mg per day) (cholesterol), dietary beta-carotene consumed (μg per day) (betadiet), dietary retinol consumed (μg per day) (retadiet), plasma beta-carotene (ng/ml) (betaplasma), plasma retinol (ng/ml) (retaplasma). The effects of the above dietary factors have been reported based on the analyses of betaplasma and retaplasma [13]. Two separate joint generalized linear models (one for betaplasma and the other for retaplasma) under Log-normal distribution have been developed [13].

From betaplasma analysis [13; Table 8], the following dietary effects on betaplasma can be obtained. It has been shown [13; Table 8] that smoking status (0 = never, 1 = former, 2 = current smoker) (SMOKSTAT) is negatively associated with the mean betaplasma, indicating that BETAPLASMA decreases as smoking status increases. That is betaplasma level is lower for a smoker than a non-smoker. Vitamin use status (0 = yes, fairly often, 1 = yes, not often, 2 = no) (VITUSE) is also negatively associated with the mean betaplasma, indicating that betaplasma decreases as vitamin use status increases. It means that betaplasma level is lower for a patient who does not take supplementary vitamin than a patient who takes vitamin fairly often. In addition, vitamin use status is also negatively associated with the variance of betaplasma, indicating that variance of betaplasma level is higher who takes vitamin fairly often. Calories consumed (number per day)

(calories) is also negatively associated with the mean betaplasma, indicating that betaplasma decreases as the calories consumed increases. Fiber consumed (gm per day) (fiber) is positively associated with the mean betaplasma, indicating that betaplasma level increases as fiber consumed increases. Note that fiber consumed is negatively associated with the variance of betaplasma, indicating that variance of betaplasma level is lower for the patients who take more fiber. Therefore, a person who consumed more fiber has higher betaplasma levels and lower variance of betaplasma. Dietary beta-carotene consumed (µg per day) (betadiet) is positively associated with the variance of betaplasma, indicating that betaplasma variance increases as betadiet consumed increases.

From retaplasma analysis [13; Table 9], it is observed that smoking status (0 = never, 1 = former, 2 = current smoker) at level 1 (= former smoker) is positively associated with the mean retaplasma, indicating that retaplasma is higher for the former smokers. Fat consumed (gm per day) is negatively associated with the mean retaplasma, indicating that mean retaplasma level is higher for low fat consumed patients. betadiet consumed (µg per day) is positively associated with the variance of retaplasma, indicating that retaplasma variance increases as betadiet consumed increases. The above associations of different dietary factors with betaplasma and retaplasma are shown in table 1.

| Response | Associated with | Association type | P-value |
|---|---|---|---|
| Mean betaplasma | Smoking 2 | Negative | P = 0.14 |
| | Smoking 3 | Negative | P = 0.02 |
| | Vitamin use 2 | Negative | P = 0.71 |
| | Vitamin use 3 | Negative | P < 0.001 |
| | Calories | Negative | P = 0.09 |
| | Fiber | Positive | P < 0.001 |
| Variance betaplasma | Fiber | Negative | P = 0.01 |
| | Dietary beta-carotene | Positive | P = 0.02 |
| | Vitamin use 2 | Negative | P = 0.13 |
| | Vitamin use 3 | Negative | P = 0.03 |
| Mean retadiet | Smoking 2 | Positive | P = 0.04 |
| | Smoking 3 | Positive | P = 0.95 |
| | Fat | Negative | P = 0.11 |
| Variance retadiet | Dietary beta-carotene | Positive | P = 0.02 |

*Table 1: Association of betaplasma and retaplasma with different dietary factors.*

From the report it is observed that fiber and supplementary vitamin intake are the protective factors, while smoking, calories and fat consumption are the risk factors of cancer. Dietary beta-carotene consumption has some effects on the variance of betaplasma and retaplasma, while dietary retinol consumption has no effect. Alcohol consumption has no effect on both betaplasma and retaplasma. Therefore, smoking should be stopped. Calories and fat consumption should be reduced. Fiber food and supplementary vitamin intake to be increased. Alcohol consumption should be stopped for saving from alcoholic cirrhosis [14].

## Conflict of Interest

The author confirms that this article content has no conflict of interest.

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