

POTATOES - A NUTRITIOUS FOOD DESPITE WHAT SOME SAY ¹

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ABSTRACT

Recent attention has been generated in the media indicating that the peels of potatoes and the potatoes themselves may not be nutritious foods. Claims that most nutrients of the potato are in the peel are unfounded; the nutrient composition of the tuber being distributed throughout the cortex and the peel. Although data has been generated to suggest that unpeeled potatoes contain greater amounts of phenolic compounds than peeled or uncooked potatoes, no evidence substantiates any hazard associated with the consumption of potato peels. Potatoes contribute substantial quantities of vitamin C, protein, crude fiber, minerals and B vitamins to the human diet.

Potatoes (*Solanum tuberosum*) have generally been considered a major part of the American diet. The nutritional quality of potatoes has often been lost amongst false perceptions that the caloric contribution of potatoes to the diet is great. More recently, potato skins or peels have been recognized as sources of substantial concentrations of potential natural toxicants such as phenolic compounds.

Phenolic compounds in potatoes. A research paper (Gosselin and Mondy, 1987) reported that unpeeled Katahdin potatoes cooked by boiling in distilled water, boiling in 16% salt solution or steaming contained significantly greater amounts of phenolics than peeled and uncooked potatoes. This research summary suggested to the media that phenolic constituents of potato peels, and potatoes, provided a significant risk to persons consuming potatoes or potato peels. The research project did not address the hazards associated with consuming phenolic compounds, nor does a comprehensive look at past consumption of phenolic compounds in potatoes or potato peels allude to any great hazard. I do not believe the consumption of moderate quantities of potato peels containing phenolic compounds is hazardous to your health.

Nutrient composition of potatoes. More importantly, I think the nutrient composition of potatoes must be emphasized. Consumers should be informed of the nutritional advantages of eating potatoes.

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As reported in the USDA Agricultural Handbook (USDA, 1984), potatoes provide approximately 79 Cal per 100 g, a very moderate caloric contribution to diets averaging 2200-2500 calories per day for the American adult. Potatoes also contribute approximately 2 g of excellent protein per 100 g of potatoes to the American diet. Potatoes are also an excellent source of:

Vitamin C	19.7 mg/100 g
Niacin	1.5 mg/100 g
Folacin	12.8 mcg/100 g
Magnesium	21 mg/100 g
Phosphorous	543 mg/100 g.

Potato peels offer significant quantities of the same nutrients, and in addition offer greater quantities of folacin (17.3 mcg/100 g) and iron (3.2 mg/100 g) than are available in the potato flesh. The sodium contribution of potatoes for consumers concerned about the relationship between sodium and high blood pressure is only about 5 mg/100 g in the flesh and 10 mg/100 g in the peel.

In a publication entitled "Composition of raw and cooked potato peel and flesh: proximate and vitamin composition" (Augustin et al, 1979) the authors pointed out that the peel amounts to only 6-10% of total tuber weight. Nutrient constituents in the peel relative to the nutrient constituents of the entire tuber were less than 10%, with the exception of crude fiber and ash. Augustin et al (1979) concluded claims that most nutrients are in the potato peel are unfounded.

Vitamin A content of potatoes. More recently, potato breeders have expressed an interest in improving the nutrient quality of potatoes by genetically enhancing the concentration of nutritional constituents. Within the last month, I have had the opportunity to test eight lines of potatoes provided me by Chuck Brown, USDA/ARS, Prosser, Wa. and Joe Pavsek, USDA/ARS, Aberdeen, Id. These breeders were interested in determining the quantity of beta-carotene, a precursor to vitamin A, in potatoes. Although the yellow color of vegetables may not be a quantitative indicator of beta-carotene, potatoes with a yellow color were selected for beta-carotene analysis (Table 1).

Table 1. Micrograms beta-carotene per 100 grams potato tissue.

Russet Burbank	34.01
Urgenta	101.35
Yellow Finn	126.34
Bintie	130.92
ARR 4120-2	139.12
Yukon Gold	59.92
ADX 882-19	567.18
D 4.40	613.74
D 6.11	742.94

To put the concentrations of beta-carotene in perspective, Recommended Dietary Allowances for vitamin A are now expressed as retinol equivalents, with one retinol equivalent equal to 6 mcg of beta-carotene. The RDA for infants to adults ranges from 400 to 1000 mcg retinol equivalents, or 2400 to 6000 mcg of beta-carotene (National Academy of Sciences, 1980). The practical contribution of 500-750 mcg of beta-carotene per 100 g of raw potato tissue is significant, especially for infants and children. However, we should not begin to compare potatoes with carrots (Daucus carota) which may contain as much as 15,000 mcg of beta-carotene per 100 g.

The breeding lines of potatoes presented to me, especially ARR 4120-2, was observed to have a light green ring beneath the peel extending about one centimeter into the flesh of the tuber. Potato "greening" is indicative of the presence of substantial quantities of the alkaloid solanine, reported to be present in concentrations reaching 0.04% in potato sprouts and recognized as a natural toxicant in potato tubers. Although there was no opportunity to conduct solanine analysis, I suggest that plant breeders be aware of the risks and hazards associated with the potential solanine concentration in new selections of potato tubers.

In conclusion, I recommend that instead of dwelling on the unlikely and inherent hazards associated with natural toxicants such as phenolics and solanine in potatoes, the potato industry continue to inform and educate the consumer by encouraging and marketing the substantial nutrient content of potatoes. I believe consumption of potato tissue and potato skins is nutritious, wholesome and safe. I encourage American consumers to eat more potatoes, enjoy the natural flavor, and at the same time be aware of the fats often associated with prepared potatoes: fat carried in baked potato toppings, French fries and potato chips. It is important to the potato industry of Washington and to the health of the American consumer that the advantageous nutritional quality of potatoes receive enthusiastic attention and consideration.

References

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