

SWEET POTATOES: A SLEEPING GIANT IN THE SPACE AGE

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Who will be the first to plant a sweet potato on the moon? Both the United States and Russia are screening plants for use in establishing moon bases. The plants selected must be able to eliminate the pollution of man by using exhaled carbon dioxide and excreted nitrogen to produce nutritional food and regenerate oxygen. Because of its high yield, good nutritional ability, the sweet potato may well be a top contender. The sweet potato can take advantage of long growing seasons on the moon or in Southern United States to produce higher yields than any other cultivated crop, yielding a food which, in emergency, can sustain life by itself.

Scientific investigations dating back at least to 1921 show that some varieties of sweet potato have appreciable amounts of protein, in addition to the frequently stressed large amounts of starch. In Western New Guinea there lives one of the least known tribes of people in the world, the Papuans, who have lived almost exclusively on sweet potatoes for centuries. In China, before World War II, the sweet potato was shown to be able to protect hard-working men from famine when the grain crops failed.

The nutrition effectiveness of sweet potatoes was something of a surprise to nutritionists because most plant proteins could not sustain life, to say nothing of supporting growth at the levels found in sweet potatoes. Recently scientists in Japan and at North Carolina State University have shown that the protein of sweet potato is almost as high quality as most choice animal proteins. They believe this is because the sweet potato proteins are working cellular proteins rather than storage proteins which are predominant in dried beans and grains.

A balanced diet is more realistic and much preferred to the elusive perfect food and the sweet potato can contribute greatly to balancing a diet.

A few calculations show how the sweet potatoes can contribute to balancing a diet. A small 8-ounce sweet potato which provides 225 calories, about the same as a packaged diet breakfast, will provide nearly one fifth of your minimum protein needs. The protein is high in lysine, an essential protein building block, which is uniformly low in grains, so the sweet potato helps to balance this inadequacy of grains in your diet. A recent National Nutritional Survey suggests that many American diets are low or borderline in respect to vitamin A. The same small sweet potato will supply your vitamin A requirements for four days. This vitamin can be stored in the body for weeks or under unusual circumstances for months so the excess is insurance. You would also obtain twice as much vitamin C as you need for that day and enough iron for a woman for two and a half days. Sweet potato is not the perfect food. Should you decide to get all of your vitamin B₁ from sweet potato, you need to eat eight pounds. You would have to work pretty hard to burn up the 3600 calories or gain weight, but you would more than satisfy your needs for other vitamins and minerals. It would be wiser to eat fewer sweet potatoes and satisfy your B vitamin requirements with modest helpings of beans, grains, or animal liver.

In the orient centuries of wisdom have developed methods of modifying unbalanced foods to provide more balanced diets. The precipitated soybean curd known as Tofu in China and Japan or Tokua in the Philippines, provides a protein concentrate, without the oil and several digestion inhibitors which make up half the weight of dried soybeans. The deproteinated residues are used for various industrial processes. With steadily increasing yields of sweet potatoes in the Southern United States, the time is rapidly approaching when sweet potatoes will be a more economical farm source of starch than corn. When this happens, it will be necessary to find uses for non-starch residues. One of the residues which North Carolina State University scientists have obtained is a concentrated carotene paste which contains tens of millions of units of vitamin A per pound. This paste would be highly desirable for supplementing other foods. Some of this orange paste might be added to manufactured foods such as

soybean curd to assure adequate vitamin A to oriental diets. The supply would greatly exceed demands for human foods so most of it will probably be used as supplements for animal feeds to provide more economical animal products. The protein can most probably be isolated on a large industrial scale as a bland, gray-colored powder. It would be an excellent supplement in grain products, bean dishes, or as a thickener for gravy. It may perhaps be added to soybean curd during manufacture to make that food more biologically complete. This would provide better nutrition for the busy executive with his coffee and roll breakfast, lunch at an oriental restaurant, and cocktails and hors d'oeuvres in the evening. It would also provide adequacy to diets which have become monotonous due either to habit or limited income. The possibilities may be limited only by the imagination of cooks and food scientists.

You have no doubt heard of plans for feeding human populations with microorganisms. If cows could smile, they would at this. The very first cow, and all after her, have lived on microbial-produced foods. Each cow carries within her a 6-12 gallon fermentation vat in which her personal microbes convert what we may call "trash foods" into nutritionally complete foods. Working in the dark of a cow's rumen, having no chlorophyll for trapping energy from sunlight, these microorganisms must use energy foods to power their minute chemical factories. On a yet very limited scale, cattle feeders are taking advantage of the characteristics of the cow and her microorganisms by feeding a mixture of sweet potatoes and urea. Urea is a chemical step away from nitrogen fertilizer, but using the abundant instant energy source of sweet potatoes, the cow's microorganisms convert the nitrogen into high quality protein and an abundance of vitamins. Scientists have found that microorganisms will work in glass flasks as well as in a cow. The starch of the sweet potato has been used as energy to convert simple forms of

nitrogen into yeast proteins and B vitamins yielding a paste containing up to 30% protein with vitamin A and C values slightly greater than the original sweet potato. Nitrogen used in this manner is far more productive than that scattered on a field to promote plant growth. The sweet potato-yeast paste is probably about as complete a food as could be produced, once you get used to it. It really isn't bad and future generations may find it quite delicious as well as essential in supporting expected increases in world population as well as moon bases.