

## Cost of Food at Home for a Week in Alaska June 2000

### 23 Communities Surveyed

Up to three stores in each of 23 communities were surveyed during June of 2000 for the cost of a specific set of food and non-food items. The 104 food items selected were taken, with some modification, from the USDA Low-cost Food Plan which is itself based on a nationwide survey of eating habits of Americans, conducted in 1977-78. In addition, the costs of such items as water, propane and electricity were collected. All costs were adjusted to reflect local sales tax where applicable.

The estimated prices of unavailable food items in various communities were calculated as the expected cost as judged from the prices of all available items relative to the price of those items in Anchorage. The percent of foods unavailable in each community are shown in the survey.

Weekly food consumption rates for a family of 4, children 6 - 11 years, form the basis of the expressed food costs. All other costs are ratios of that cost as calculated from the USDA Cost of Food at Home survey issued June 2000. The cost for this family of 4 can be calculated from the table by summing the individual members. For smaller families such a sum would be too low and should be adjusted up by 20%, 10% or 5% for families of 1, 2 or 3 persons respectively. Similarly, the sum for larger families would be too high and downward adjustments of 5% and 10% are suggested for 6 and 7 or more member families. These adjustments reflect that some economies may be realized when preparing foods for larger families.

Rows 18 through 22 represent historical food costs. The Anchorage column is a comparison of present to previous Anchorage costs. Similarly the U.S. Average column represents changes in U.S. average prices. A one (1) appearing in the Anchorage column indicates that the current Anchorage cost is 1% higher now than at that date. Therefore, rising food costs are indicated by positive values. The remaining columns are each community's cost relative to Anchorage at that date. For instance, a cell containing a one (1) indicates a community that was experiencing a food cost 1% higher than Anchorage at that date. Note that the dollar value of the U.S. Average is not included in this survey since the methodology is not equivalent.

### Vitamin A

Vitamin A, also known as retinol, is a fat soluble compound indispensable for survival. Humans cannot synthesize vitamin A per se, so it must come in the diet in some form. This includes retinol and the retinol precursors beta-carotene and some other orange colored pigments. For this reason dietary advice for consuming vitamin A is usually given as dark green or orange leafy vegetables. Excess vitamin A accumulates primarily in the liver, so fish liver oils (cod, shark) are good sources. While most people do not have a ready source of polar bear liver, it is a well known, even notorious source of vitamin A. That is, vitamin A is toxic marginally above required levels and polar bear liver is exceptionally potent. Even in humans a reasonable amount of vitamin A storage normally occurs, a diet devoid of all sources vitamin A would produce serious deficiency symptoms within two years.

One of the many roles of retinol (as vitamin A is often referenced, other forms are retinoic acid, retinol esters and retinal) involves gene regulation (a functional subunit of DNA). The presence of retinoic acid is required within a cell's nucleus for interpretation of DNA in the synthesis of some proteins. Retinol binds with specific nuclear proteins which in turn bind to regulatory sites on DNA thereby moderating local DNA activity (transcription). The net result is growth rate control in developing tissues (e.g. immune system, epithelial, fetal tissue). Like vitamin D, vitamin A has hormone-like functions within a cell's nucleus (the analogy to vitamin D goes further as vitamin A substitutes for vitamin D in brain cells, where vitamin D itself is inactive in stimulating production of calcium binding protein). It is the involvement in cell division regulation that has led to vitamin A derivatives as useful cancer treatments. However, chronic high doses of vitamin A and its derivatives may cause degradation of the skeletal system and thus development of osteoporosis. There is recent evidence that a malfunction in vitamin A dependent gene regulation is involved in diabetes mellitus.

Vitamin A dependent gene regulation is critical within the womb. If timing is everything, then development of a human being is mastery in timing itself. Normal cell division and growth during fetal development is vitamin A dependent. However, the fetus is particularly sensitive to retinol, elevated intake of the vitamin leads to teratogenic

effects (birth defects) ranging from permanent learning disability with slight excess to gross physical defects with excessive intake. Vitamin A supplementation is not recommended during pregnancy but the provitamin form (carotenoids) can be taken without ill-effect.

Fast growing tissues such as immune and epithelial tissues (which for instance line the gut and respiratory tract and its various sinuses) have a high demand for retinol. Deficiency of vitamin A leads to impaired immune function and an increased chance for infection. For instance, measles remains a deadly disease in developing countries for which it is well documented that mortality and morbidity is significantly higher with low circulating retinol levels (measles itself further depletes circulating retinol). Vitamin A has been administered effectively in such cases. Epithelial cells require vitamin A to become fully functional in their secretory and absorptive roles.

The widely known role for vitamin A is vision (as retinal). For reasons related to the colorful dietary source of this vitamin, it is sensitive to light. The classic subclinical symptom of vitamin A deficiency is 'night blindness', although many more sensitive techniques are now available. A deficient individual will collide with objects in a dimly lit room which are readily visible with normal vision. Grains are generally low in vitamin A. For instance, night blindness will occur in livestock fed an unsupplemented high grain diet. Determining the adequate dietary level of vitamin A is complex. Simplified recommendations are given in retinol equivalents (RE, 1 RE = 1 microgram retinol = 6 micrograms beta carotene = 12 micrograms mixed provitamin A carotenoids; 1 microgram retinol = 3.33 IU but IU's do not readily correspond to retinol equivalents). The RDA is 1000 RE for men, 800 RE for women and less than half that for children. The RDA for retinol itself in pregnant women is 0, although carotenoids are allowable. The US recommendations are liberal by international standards. Table 1 shows some Alaskan sources of vitamin A.

**Table 1. Vitamin A content of some Alaskan foods.<sup>1</sup>**

Food	Vitamin A <sup>2</sup>	Food	Vitamin A
Black Bear Meat	78	Moose Liver	28800
Polar Bear Meat	420	Dried King Salmon	192
Beluga Meat	102	Seal Meat	315
Beluga Liver	6630	Seal Liver	10980
Blueberry	49	Walrus Meat	51
Caribou Liver	8640	Walrus Liver	24360
Chicken Eggs	191	Willow Leaves	5610
Moose Meat	93		

<sup>1</sup> per 100 grams wet weight. 100 g = 3.6 oz.

<sup>2</sup> converted from IU

#### Sources

- Berdanier, C.D. 1998. *Advanced Nutrition: Micronutrients*. CRC Press, Washington, D.C.  
 Binkley, N. and Krueger, D. 2000. Hypervitaminosis A and bone. *Nutr. Rev.* 58(5):138-144.  
 Nobmann, E. 1993. *Nutrient Values of Alaska Native Foods*. US Dept. Health and Human Services, Indian Health Service.  
 Olsen, J.A. 1996. Vitamin A. In *Present Knowledge in Nutrition*, 2nd ed. ILSI Press, Washington, D.C.  
 Prakash, P., Krinsky, N.I., Russell, R.M. 2000. Retinoids, carotenoids, and human breast cancer cell cultures: a review of differential effects. *Nutr. Rev.* 58(6):170-176.  
 Russell, R.M. 2000. The vitamin A spectrum: from deficiency to toxicity. *Am. J. Clin. Nutr.* 71:878-884.  
 West, C. 2000. Vitamin A and measles. *Nutr. Rev.* 2(Part II):S46-S54.

Submitted by:

Bret R. Luick  
 Foods & Nutrition Specialist