



THE WESTON A. PRICE FOUNDATION  
 for **Wise Traditions** IN FOOD, FARMING, AND THE HEALING ARTS  
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## REVISIONS TO THE WIC FOOD PACKAGES

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The Weston A. Price Foundation is pleased to offer recommendations regarding question 2: What changes, if any, are needed to the types of foods currently authorized in the WIC food packages?

We will address two issues: (1) include one pound of butter per month for Food Packages IV through VII and (2) restrict the availability of soy infant formula.

**A. Include one pound of butter per month for Food Packages IV, V, VI, VII**

Rationale: Butter is America's best source of fat soluble vitamins, which include true vitamin A or retinol, vitamin D, vitamin K and vitamin E as well as all their naturally occurring cofactors needed to obtain maximum effect. In fact, vitamin A is more easily absorbed and utilized from butter than from other sources.<sup>1</sup>

Fortunately, these fat-soluble vitamins are relatively stable and survive the pasteurization process. Butter can be purchased relatively cheaply for \$2.75 to \$4.00 per pound, a very modest increase in cost to the Food Packages, but one that will reap many health benefits.

Our recommendation does not include margarine or any other butter substitute. Margarines and butter substitutes are generally manufactured from partially hydrogenated vegetable oils, which are known to have high levels of *trans* fatty

<sup>1</sup> Fraps, G S, and A R Kemmerer, *Texas Agricultural Bulletin*, Feb 1938, No 560.

acids. *Trans* fatty acids are sufficiently similar to natural fats that the body readily incorporates them into the cell membrane; once there their altered chemical structure creates havoc with thousands of necessary chemical reactions—everything from energy provision to prostaglandin production.

Most of the *trans* isomers in modern hydrogenated fats are new to the human physiology and by the early 1970's a number of researchers had expressed concern about their presence in the American diet, noting that their increasing use had paralleled the increase in both heart disease and cancer.<sup>2</sup>

Margarine provokes chronic high levels of cholesterol and has been linked to both heart disease and cancer.<sup>3</sup> The new soft margarines or tub spreads, while lower in hydrogenated fats, are still produced from rancid vegetable oils and contain many additives.<sup>4</sup>

Judging from both food data and turn-of-the-century cookbooks, the American diet in 1900 was a rich one—with at least 35 to 40 percent of calories coming from fats, mostly dairy fats in the form of butter, cream, whole milk and eggs. Salad dressing recipes usually called for egg yolks or cream; only occasionally for olive oil. Lard or tallow served for frying; rich dishes like head cheese and scrapple contributed additional saturated fats during an era when cancer and heart disease were rare. Butter substitutes made up only a small portion of the American diet, and these margarines were blended from coconut oil, animal tallow and lard, all rich in natural saturates.

When Dr. Weston A. Price studied isolated traditional peoples around the world in the 1930s<sup>5</sup>, he found that butter was a staple in many native diets. (He did not find any isolated peoples who consumed polyunsaturated oils.) The groups he studied particularly valued the deep yellow butter produced by cows feeding on rapidly growing green grass. Their natural intuition told them that its life-giving qualities were especially beneficial for children and expectant mothers. When Dr. Price analyzed this deep yellow butter he found that it was exceptionally high in all fat-soluble vitamins, particularly vitamin A. He called these vitamins "catalysts" or "activators."

Without "catalysts" or "activators," according to Dr. Price, we are not able to utilize the minerals we ingest, no matter how abundant they may be in our diets. He also believed the fat-soluble vitamins to be necessary for absorption of the water-soluble vitamins. Vitamins A and D are essential for growth, for healthy

<sup>2</sup> Enig, Mary, PhD, *Oiling of America*, [www.westonaprice.org](http://www.westonaprice.org), p. 6.

<sup>3</sup> *Nutr Week*, Mar 22, 1991, 21:12:2-3.

<sup>4</sup> Enig, Mary, PhD, *The Skinny on Fats*, [www.westonaprice.org](http://www.westonaprice.org), p. 14.

<sup>5</sup> Price, Weston A., *Nutrition and Physical Degeneration*, Price Pottinger Foundation, 1940.

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bones, for proper development of the brain and nervous systems and for normal sexual development.

Many studies have shown the importance of butterfat for reproduction; its absence results in "nutritional castration," the failure to bring out male and female sexual characteristics. As butter consumption in America has declined, sterility rates and problems with sexual development have increased. In calves, butter substitutes are unable to promote growth or sustain reproduction.<sup>6</sup>

Not all the societies Dr. Price studied ate butter; but all the groups he observed went to great lengths to obtain foods high in fat-soluble vitamins—fish, shellfish, fish eggs, organ meats, blubber of sea animals and insects. Without knowing the names of the vitamins contained in these foods, isolated traditional societies recognized their importance in the diet and liberally ate the animal products containing them. They rightly believed such foods to be necessary for fertility and the optimum development of children.

Dr. Price analyzed the nutrient content of native diets and found that they consistently provided about ten times more fat soluble vitamins than the American diet of the 1930's. This ratio is probably more extreme today as Americans have deliberately reduced animal fat consumption. Dr. Price realized that these fat-soluble vitamins promoted the beautiful bone structure, wide palate, flawless uncrowded teeth and handsome, well-proportioned faces that characterized members of isolated traditional groups.

American children in general do not eat fish or organ meats, at least not to any great extent, and blubber and insects are not a part of the western diet; many will not eat eggs. The only good source of fat-soluble vitamins in the American diet, one sure to be eaten, is butterfat. Butter added to vegetables and spread on bread, and cream added to soups and sauces, ensure proper assimilation of the minerals and water-soluble vitamins in vegetables, grains and meat.

Important nutrients found in butter, particularly required for children, include:

The Price Factor or Activator X: Discovered by Dr. Price, Activator X is a powerful catalyst which, like vitamins A and D, helps the body absorb and utilize minerals. It is found in organ meats from grazing animals and some sea food. Butter can be an especially rich source of Activator X when it comes from cows eating rapidly growing grass in the spring and fall

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<sup>6</sup> Schantz, E J, et al, *J Dairy Science*, 1940, 23:181-89

seasons. It disappears in cows fed cottonseed meal or high protein soy-based feeds.<sup>7</sup> Fortunately, Activator X is not destroyed by pasteurization.

**Arachidonic Acid:** A 20-carbon polyunsaturate containing four double bonds, found in small amounts only in animal fats. Arachidonic acid (AA) plays a role in the function of the brain, is a vital component of the cell membranes and is a precursor to important prostaglandins.

**Short- and Medium-Chain Fatty Acids:** Butter contains about 12-15% short- and medium-chain fatty acids. This type of saturated fat does not need to be emulsified by bile salts but is absorbed directly from the small intestine to the liver, where it is converted into quick energy. These fatty acids also have antimicrobial, antitumor and immune-system-supporting properties, especially 12-carbon lauric acid, a medium-chain fatty acid not found in other animal fats. Highly protective lauric acid should be called a conditionally essential fatty acid because it is made only by the mammary gland and not in the liver like other saturated fats.<sup>8</sup> We must obtain it from one of two dietary sources—small amounts in butterfat or large amounts in coconut oil. Four-carbon butyric acid is all but unique to butter. It has antifungal properties as well as antitumor effects.<sup>9</sup>

**Omega-6 and Omega-3 Essential Fatty Acids:** These occur in butter in small but nearly equal amounts. This excellent balance between linoleic and linolenic acid prevents the kind of problems associated with overconsumption of omega-6 fatty acids found in high amounts in vegetable oils.

**Conjugated Linoleic Acid:** Butter from pasture-fed cows also contains a form of rearranged linoleic acid called CLA, which has strong anticancer properties. It also encourages the buildup of muscle and prevents weight gain. CLA disappears when cows are fed dry hay or processed feed.<sup>10</sup>

<sup>7</sup> Enig, Mary PhD, Personal communication, Pat Connolly, Executive Director, Price Pottenger Nutrition Foundation.

<sup>8</sup> Enig, Mary G, PhD, "Health and Nutritional Benefits from Coconut Oil," *Price-Pottenger Nutrition Foundation Health Journal*, 1998, 20:1:1-6.

<sup>9</sup> Prasad, K N, *Life Science*, 1980, 27:1351-8; Gershon, Herman, and Larry Shanks, *Symposium on the Pharmacological Effect of Lipids*, Jon J Kabara, ed, American Oil Chemists Society, Champaign, IL, 1978, 51-62.

<sup>10</sup> Belury, M A, *Nutr Rev*, April 1995, 53:(4)83-89; Kelly, M L, et al, *J Dairy Sci*, Jun 1998, 81(6):1630-6.

**Lecithin:** Lecithin is a natural component of butter that assists in the proper assimilation and metabolization of cholesterol and other fat constituents.

**Cholesterol:** Mother's milk is high in cholesterol because it is essential for growth and development. Cholesterol is also needed to produce a variety of steroids that protect against cancer, heart disease and mental illness.

**Glycosphingolipids:** This type of fat protects against gastrointestinal infections, especially in the very young and the elderly. For this reason, children who drink skimmed milk have diarrhea at rates three to five times greater than children who drink whole milk.<sup>11</sup>

**Trace Minerals:** Many trace minerals are incorporated into the fat globule membrane of butterfat, including manganese, zinc, chromium and iodine. In mountainous areas far from the sea, iodine in butter protects against goiter. Butter is extremely rich in selenium, a trace mineral with antioxidant properties, containing more per gram than herring or wheat germ.

**The Wulzen Factor:** Called the "anti-stiffness" factor, this compound is present in raw animal fat. Researcher Rosalind Wulzen discovered that this substance protects humans and animals from calcification of the joints—degenerative arthritis. It also protects against hardening of the arteries, cataracts and calcification of the pineal gland.<sup>12</sup> Calves fed pasteurized milk or skim milk develop joint stiffness and do not thrive. Their symptoms are reversed when raw butterfat is added to the diet. Pasteurization destroys the Wulzen factor—it is present only in raw butter, cream and whole milk.

Butter is derived from animal (dairy) fat, and, therefore, is high in saturated fats. Animal fats are stable, do not easily develop free radicals, and contain nutrients that are vital for good health. Children, in particular, require high levels of quality animal fats to achieve optimal physical and neurological development.<sup>13</sup> Although consumption of saturated fatty acids in an institutional setting has been shown to temporarily raise serum cholesterol levels, there is no evidence that consumption

<sup>11</sup> Koopman, J S, et al, *AJPH*, 1984, 74:12:1371-1373.

<sup>12</sup> van Wagtenonk, W J and R Wulzen, *Arch Biochemistry*, Academic Press, Inc, New York, NY, 1943, 1:373-377.

<sup>13</sup> Enig, *Oiling of America*, p. 24.

of saturated fats from animal sources and the tropical oils contributes to heart disease.<sup>14</sup>

Processed foods containing *trans* fat sell because the American public is afraid of the alternative—saturated fats found in butter, lard, tallows and palm and coconut oil, fats traditionally used for frying and baking. Yet the scientific literature delineates a number of vital roles for saturated fats:

- Saturated fatty acids constitute at least 50% of most of the cell membranes. They are what furnish our cells necessary stiffness and integrity.

They play a vital role in the health of our bones. For calcium to be effectively incorporated into the skeletal structure, at least 50% of the dietary fats should be saturated.<sup>15</sup>

They lower Lp(a), a substance in the blood that indicates proneness to heart disease.<sup>16</sup> They protect the liver from alcohol and other toxins, such as Tylenol.<sup>17</sup>

They enhance the immune system.<sup>18</sup>

They are needed for the proper utilization of essential fatty acids. Elongated omega-3 fatty acids are better retained in the tissues when the diet is rich in saturated fats.<sup>19</sup>

Stearic acid and palmitic acid are the preferred foods for the heart, which is why the fat around the heart muscle is highly saturated.<sup>20</sup> The heart draws on this reserve of fat in times of stress.

<sup>14</sup> Ravnskov, Uffe, MD, PhD, *The Cholesterol Myths: Exposing the Fallacy that Saturated Fat and Cholesterol Cause Heart Disease*, New Trends Publishing, Washington DC, 2000. See also Mary Enig, *The Skinny on Fats*, Weston A. Price Foundation, pp. 3-5.

<sup>15</sup> Watkins, B A, et al, "Importance of Vitamin E in Bone Formation and in Chondrocyte Function" Purdue University, Lafayette, IN, *AOCS Proceedings*, 1996; Watkins, B A, and M F Seifert, "Food Lipids and Bone Health," *Food Lipids and Health*, R E McDonald and D B Min, eds, p 101, Marcel Dekker, Inc, New York, NY, 1996.

<sup>16</sup> Dahlen, G H, et al, *J Intern Med*, Nov 1998, 244(5):417-24; Khosla, P, and K C Hayes, *J Am Coll Nutr*, 1996, 15:325-339; Clevidence, B A, et al, *Arterioscler Thromb Vasc Biol*, 1997, 17:1657-1661.

<sup>17</sup> Nanji, A A, et al, *Gastroenterology*, Aug 1995, 109(2):547-54; Cha, Y S, and D S Sachan, *J Am Coll Nutr*, Aug 1994, 13(4):338-43; Hargrove, H L, et al, *FASEB Journal*, Meeting Abstracts, Mar 1999, #204.1, p A222.

<sup>18</sup> Kabara, J J, *The Pharmacological Effects of Lipids*, The American Oil Chemists Society, Champaign, IL, 1978, 1-14; Cohen, L A, et al, *J Natl Cancer Inst*, 1986, 77:43.

<sup>19</sup> Garg, M L, et al, *FASEB Journal*, 1988, 2:4:A852; Oliart Ros, R M, et al, "Meeting Abstracts," *AOCS Proceedings*, May 1998, 7, Chicago, IL.

<sup>20</sup> Lawson, L D and F Kummerow, *Lipids*, 1979, 14:501-503; Garg, M L, *Lipids*, Apr 1989, 24(4):334-9.

- **Short- and medium-chain saturated fatty acids have important antimicrobial properties. They protect us against harmful microorganisms in the digestive tract.**

**Cholesterol is not the cause of heart disease<sup>21</sup> but rather a potent antioxidant weapon against free radicals in the blood, and a repair substance that helps heal arterial damage, although the arterial plaques themselves contain very little cholesterol. The cholesterol in your diet (dietary cholesterol) has very little effect on the cholesterol in your blood (serum cholesterol). You could completely eliminate all cholesterol from your diet and your liver would just produce more of it, because your body needs cholesterol. On the other hand, eating more cholesterol would cause your liver to reduce production to maintain consistent levels.**

**Like all fats, however, cholesterol may be damaged by exposure to heat and oxygen. This damaged or oxidized cholesterol seems to promote both injury to the arterial cells (endothelium – the layer of tissue that lines all of our arteries and veins) as well as a pathological buildup of plaque in the arteries.<sup>22</sup> Damaged cholesterol is found in powdered eggs, in powdered milk (added to reduced-fat milks to give them body) and in meats and fats that have been heated to high temperatures in frying and other high-temperature processes.**

**Mother's milk is especially rich in cholesterol and contains a special enzyme that helps the baby utilize this nutrient. Babies and children need cholesterol-rich foods, such as butter, throughout their growing years to ensure proper development of the brain and nervous system.**

**In conclusion, butter is an essential food that supplies children and adults many needed nutrients. The Weston A. Price Foundation urges the WIC Program to incorporate butter into its food packages IV through VII.**

## **B. Restrict Availability of Soy Infant Formula**

**Rationale: We urge the WIC Program to restrict the availability of soy infant formula in the WIC Program. Soy infant formula should be available to WIC mothers only through a doctor's prescription.**

**The WIC program offers both milk-based and soy-based infant formula to low-income families throughout the US. An estimated 25 percent of North American bottle-fed babies receive infant formula made from processed soybeans. Use of**

<sup>21</sup> Ravnskov, Uffe, MD, PhD, *The Cholesterol Myths*.

<sup>22</sup> Addis, Paul, *Food and Nutrition News*, March/April 1990, 62:2:7-10.

soy formula in the WIC program closely corresponds to the 25 percent figure, according to the USDA.

Soy promotional material claims that soy provides complete protein that is less allergenic than cows' milk protein. However, research studies have found this claim to be inaccurate. Soy is a potent allergen.<sup>23</sup> Up to 40% of infants intolerant of cow's milk also develop soy protein intolerance.<sup>24</sup> Soy protein can cause intolerance reactions with gastrointestinal symptoms and acute anaphylaxis.<sup>25</sup>

When soy infant formula first became commercially available, manufacturers even promised that soy formula was "better than breast milk." In fact, there are many toxins in soy infant formula, some that occur naturally in the soybean and some that are added during processing. When an infant consumes soy-based formula as its only food, it receives a very large dose of these toxins. Even in Asia, soy is consumed only in small amounts—ranging from 10 to 60 grams per day—usually as a fermented condiment. Soy was never traditionally used for infant feeding.

Soy-based formulas contain high levels of anti-nutrients that can block mineral absorption and inhibit digestion. They contain very high levels of manganese, which have recently been linked to brain damage and violent behavior in older children and adults who were fed soy formula.<sup>26 27 28 29 30 31</sup> Developmental problems are compounded by the fact that these formulas lack both cholesterol and lactose, which are vital to the development of the brain and nervous system.

Soy Protein Isolate (SPI) is the major ingredient in soy-based infant formula. SPI is produced using many chemicals and at high temperatures and pressures, causing a reduction in protein quality. Processing reduces but does not eliminate the many anti-nutrients naturally occurring in soy (phytic acid, protease inhibitors, lectins, etc.)

In rats, feeding SPI caused increased requirements for vitamins E, K, D and B<sub>12</sub>, created deficiency symptoms of calcium, magnesium, manganese, molybdenum, copper, iron and zinc.<sup>32</sup> SPI does not have Generally Recognized as Safe (GRAS) status.

<sup>23</sup> Tonz O et al, Paediatrica, 1997.

<sup>24</sup> Hill DJ et al, Clin Rev Allergy, 1984.

<sup>25</sup> Hill, 1984.

<sup>26</sup> Position of the United Soybean Board: Manganese and Soy-Based Infant Formula.

<sup>27</sup> Collip PJ et al, Ann Nutr Metab, 1983.

<sup>28</sup> Woolf A et al, Enviro Health Perspect, 2002.

<sup>29</sup> Dorman DC et al, J Appl Toxicol, 2000.

<sup>30</sup> Pappas BA et al, Neurotoxicol and Teratol, 1997.

<sup>31</sup> Tran TT et al, NeuroToxicol, 2002.

<sup>32</sup> Joseph, J Rackis, "Biological and Physiological Factors in Soybeans," *Journal of the American Oil Chemists' Society*, January 1974, 51:161A-170A.

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Most importantly, soy-based formula contains very high levels of phytoestrogens (isoflavones), plant-based estrogens that can cause endocrine disruption, resulting in early maturation and fertility problems in girls and delayed sexual development in boys.

Babies fed soy-based formula have 13,000 to 22,000 times more estrogen compounds in their blood than babies fed milk-based formula.<sup>33</sup> Infants exclusively fed soy formula receive the estrogenic equivalent of at least five birth control pills per day. Almost 15 percent of white girls and 50 percent of African-American girls show signs of puberty, such as breast development and pubic hair, before the age of eight.<sup>34</sup> Some girls are showing sexual development before the age of three. Premature development of girls has been linked to the use of soy formula and exposure to environmental estrogen-mimickers such as PCBs and DDE.

Male infants undergo a “testosterone surge” during the first few months of life, when testosterone levels may be as high as those of an adult male. During this period, baby boys are programmed to express male characteristics after puberty, not only in the development of their sexual organs and other masculine physical traits, but also in setting patterns in the brain characteristic of male behavior. In animals, soy feeding indicates that phytoestrogens in soy are powerful endocrine disrupters. Rats exposed to soy isoflavones at very low doses in utero and as infants have smaller testes than normal and exhibit inhibited sexual behavior.<sup>35</sup>

In a recent study, infant male marmoset monkeys were fed either soy-based or milk-based formula. The neonatal testosterone rise was suppressed in the soy-fed monkeys up to 70%. Levels of isoflavones in the monkey diets were 40-87 percent of that reported in 4-month human infants fed a 100% soy-based formula diet. “It is therefore considered likely that similar, or larger, effects to those shown here in marmosets may occur in human male infants fed with SFM [soy formula milk].”<sup>36</sup>

Serum genistein (a phytoestrogens found in soy formula) concentrations found in soy-fed infants may be capable of producing thymic and immune abnormalities, as suggested by previous reports of immune impairments in soy-fed infants.<sup>37</sup> Infant mice given genistein developed cancer of the uterus later in life. “The data

<sup>33</sup> *Am J Clin Nutr* 1998 Dec;68(6 Suppl):1453S-1461S.

<sup>34</sup> Freni-Titulaer LW and others. *Am J Dis Child* 1986 Dec;140(12):1263-1267.

<sup>35</sup> Wisniewski AB and others. Exposure to genistein during gestation and lactation demasculinizes the reproductive system in rats. *Journal of Urology*, April 2003 169:1582-1586.

<sup>36</sup> Sharpe RM and others. Infant feeding with soy formula milk: effects on the testis and on blood testosterone levels in marmoset monkeys during the period of neonatal testicular activity. *Hum Reprod* 2002 Jul;17(7):1692-703.

<sup>37</sup> Yellaya S and others. The phytoestrogen genistein induces thymic and immune changes: a human health concern? *Proc Natl Acad Sci USA* 2002 May 28;99(11):7616-21.

suggest that genistein is carcinogenic if exposure occurs during critical periods in a young animal's development."<sup>38</sup>

Scientists at the National Institute of Environmental Health Sciences in North Carolina treated newly born mice with the soy phytoestrogen genistein for the first five days after birth. They found that significant alterations occurred in the ovaries. Their conclusion: "Given that human infants are exposed to high levels of genistein in soy-based foods, this study indicates that the effects of such exposure on the developing reproductive tract warrant further investigation."<sup>39</sup>

Soy formula fed to premature babies caused an increase in digestive enzymes compared to milk-fed babies, indicating low digestibility of soy formula.<sup>40</sup> Soy feeding caused damage to small bowel mucosa in two infants. The damage was similar to that of celiac disease and consistent with a lectin-induced toxicity.<sup>41</sup> Twice as many soy-fed children developed diabetes as those in a control group that was breast fed or received milk-based formula.<sup>42</sup> Soy based or milk-free formulas contained about 8-15 times more cadmium than milk-based formulas as well as high amounts of fluoride.<sup>43</sup>

Soy is not a healthy alternative for infants unable to tolerate milk-based formula. Often babies grow normally on soy formula with the problems appearing only later, at the onset of puberty. Some of the problems reported anecdotally in children who were brought up on soy formula include extreme emotional behavior, learning difficulties, asthma, immune system problems, irritable bowel syndrome, depression, early development in girls and disrupted sexual development boys.

Although reported in the media as a vindication of soy infant formula, a recent study by Strom et al published in Journal of the American Medical Association actually found that soy-fed infants had more reproductive problems and more asthma as adults.<sup>44</sup>

<sup>38</sup> Newbold R and others. Increased uterine cancer seen in mice injected with genistein, a soy estrogen, as newborns. *Cancer Research* 2002 Jun 1;61(11):4325-8.

<sup>39</sup> Jefferson WN and others. Neonatal exposure to genistein induces estrogen receptor (ER)alpha expression and multiocyte follicles in the maturing mouse ovary: evidence for ErbB-mediated and nonestrogenic actions. *Biol Reprod* 2002 Oct;67(4):1285-96.

<sup>40</sup> Lebenthal E and others. The development of pancreatic function in premature infants after milk-based and soy-based formulas. *Pediatr Res* 1981 Sep;15(9):1240-1244.

<sup>41</sup> Poley JR and Klein AW. Scanning electron microscopy of soy protein-induced damage of small bowel mucosa in infants. *J Pediatr Gastroenterol Nutr* 1983 May;2(2):271-87.

<sup>42</sup> Fort P and others. Breast feeding and insulin-dependent diabetes mellitus in children. *J Am Coll Nutr* 1986;5(5):439-441.

<sup>43</sup> Dabeka RW and McKenzie AD. Lead, cadmium, and fluoride levels in market milk and infant formulas in Canada. *J Assoc Off Anal Chem* 1987;70(4):754-7 (1987).

<sup>44</sup> Strom BL and others. Exposure to soy-based formula in infancy and endocrinological and reproductive outcomes in young adulthood. *JAMA* 2001 Nov 21;286(19):2402-3.

Often soy-based formula is automatically given to African American mothers on the premise that African American infants are lactose intolerant. This is a fallacy. African American infants are no more prone to lactose intolerance than the children of other races. Virtually all babies produce the enzyme lactase for digesting lactose, the sugar in milk, as human milk is very high in lactose.

Babies who are allergic to milk can be given a commercially available formula of hydrolyzed protein or one based on meat. We suggest that USDA encourage the development of meat-based infant formulas for the small numbers of infants who are truly allergic to milk-based formula.

A summary of health issues caused by soy is as follows:

- High levels of phytic acid in soy reduce assimilation of calcium, magnesium, copper, iron and zinc.<sup>45 46 47 48 49 50 51 52 53</sup> Phytic acid in soy is not neutralized by ordinary preparation methods such as soaking, sprouting and long, slow cooking. High phytate diets have caused growth problems in children.<sup>54</sup>
- Trypsin inhibitors in soy interfere with protein digestion and may cause pancreatic disorders. In test animals soy containing trypsin inhibitors caused stunted growth.<sup>55 56</sup>
- Soy phytoestrogens disrupt endocrine function and have the potential to cause infertility<sup>57</sup> and to promote breast cancer in adult women.<sup>58 59 60 61</sup>
- Soy phytoestrogens are potent antithyroid agents that cause hypothyroidism and may cause thyroid cancer. In infants, consumption of soy formula has been linked to autoimmune thyroid disease.<sup>62</sup>

<sup>45</sup> Chitra U et al, *Plant Foods Hum Nutr*, 1995.

<sup>46</sup> Steichen et al, *J Pediatr*, 1987.

<sup>47</sup> Chan et al, *Am J Dis Child*, 1987.

<sup>48</sup> Hillman et al, *J Pediatr*, 1988.

<sup>49</sup> Sandstrom et al, *Am J Dis Child*, 1983.

<sup>50</sup> Lönnerdal B et al, *Am J Clin Nutr*, 1999.

<sup>51</sup> Davidsson L et al, *Am J Clin Nutr*, 1995.

<sup>52</sup> Davidsson L et al, *Pediatr Res*, 1994.

<sup>53</sup> Rackis J, *J Am Oil Chem Soc*, 1974.

<sup>54</sup> American Academy of Pediatrics Policy Statement, *Pediatrics*, 1998.

<sup>55</sup> Liener IE, *Arch Latinoam, Nutr*, 1996.

<sup>56</sup> Liener IE, *J Nutr*, 1995.

<sup>57</sup> Cassidy A et al, *Am J Clin Nutr*, 1994.

<sup>58</sup> Dees C et al, *Environ Health Perspect*, 1997.

<sup>59</sup> Hsieh CY et al, *Cancer Res*, 1998.

<sup>60</sup> McMichael-Phillips DF et al, *Am J Clin Nutr*, 1998.

<sup>61</sup> Martin PM et al, *Endocrinology*, 1978.

- Vitamin B<sub>12</sub> analogs in soy are not absorbed and actually increase the body's requirement for B<sub>12</sub>.<sup>63</sup>
- Soy foods increase the body's requirement for vitamin D. Toxic synthetic vitamin D<sub>2</sub> is added to soy milk.
- Soy phytoestrogens consumption can produce an increase in anxiety and stress.<sup>64</sup>
- Fragile proteins are over-denatured during high temperature processing to make soy protein isolate and textured vegetable protein.
- Processing of soy protein results in the formation of toxic lysinoalanine and highly carcinogenic nitrosamines.
- Free glutamic acid or MSG, a potent neurotoxin, is formed during soy food processing and additional amounts are added to many soy foods.
- Soy foods contain high levels of aluminum (10 times higher than in milk-based formulas and 100 times higher than breast milk), which is toxic to the nervous system and the kidneys.<sup>65</sup>
- Soy infant formula contains no cholesterol, a substance vital to the development of the brain and nervous system.<sup>66 67</sup>

In other countries, official recommendations about soy have included warnings about overuse or side effects:

- The Australian College of Pediatrics recommends that soy formula not be indiscriminately used, noting that the routine use of soy may result in side effects.<sup>68</sup>

<sup>62</sup> Fort P and others. Breast and soy-formula feedings in early infancy and the prevalence of autoimmune thyroid disease in children. *J Am Coll Nutr* 1990;9:164-167.

<sup>63</sup> *Nutrition Reviews*, 1979, 37:142-144; Specker, B L, et al, *American Journal of Clinical Nutrition* 1988, 47:89-92; Berg H van den, et al, *The Lancet*, 1988, 1:242-3; Herbert, V, *American Journal of Clinical Nutrition*, 1987, 46:387-402; Murray, M T, *American Journal of Natural Medicine*, April 1996, 3:(3):10-15; Ensminger, A H, et al, *Encyclopedia of Foods & Nutrition*, 1994, CRC Press, Boca Raton, FL, 1984.

<sup>64</sup> Hart Hartley DC and others. The soya isoflavone content of rat diet can increase anxiety and stress hormone release in the male rat. *Psychopharmacology* (Berl) 2003 Apr ;167(1) :46-53.

<sup>65</sup> McGraw MD and others. Aluminum content in milk formulae and intravenous fluids used in infants. *Lancet* I:157 (1986).

<sup>66</sup> Pond WG, *Proc Soc Biol Med*, 2000.

<sup>67</sup> Owen CG et al, *Pediatrics*, 2002.

<sup>68</sup> The Australian College of Paediatrics, *J Paediatr Child Health*, 1998.

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- The New Zealand Ministry of Health recommends routine assessment of thyroid function in infants on soy formula.<sup>69</sup>
- A Canadian Government Committee recommends the restriction of soy-based formula to infants who “cannot be fed dairy-based products for healthy, cultural or religious reasons, including galactosemia or a vegan lifestyle.”<sup>70</sup>
- The Food Safety Authority of Ireland does not recommend the routine use of soy-based formula in infants.<sup>71</sup>
- The Swiss Federal /Commission on Food recommends the “use of soya bean products as baby foods should be made very restrictive” and allowed only in a few medical conditions (lactose intolerance, galactosemia and cow’s milk allergy).<sup>72</sup>
- The United Kingdom Department of Health states that cow’s milk formulas are preferable for most bottle-fed babies and that infant formula manufacturers should investigate ways to reduce the levels of phytoestrogens in soy-based infant formulas.<sup>73 74</sup>
- The UK Working Group of the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) recently stated that “there is cause for concern about the use of soy-based infant formula. Additionally, there is neither substantive medical need for, nor health benefit arising from, the use of soy-based infant formula.” (2003)<sup>75</sup>

According to Dr. Daniel Sheehan, National Center for Toxicological Research of the FDA, “The use of soy formulas as a large, uncontrolled, and basically unmonitored human infant experiment continues unabated.”

The Weston A. Price Foundation urges the WIC Program and the USDA to seriously consider the health implications of providing soy infant formula to WIC babies unabated. We urge the WIC Program to restrict the availability of soy infant formula. Soy infant formula should be available to WIC mothers only through a doctor’s prescription.

<sup>69</sup> New Zealand Ministry of Health, Soy based infant formula, 1998.

<sup>70</sup> Health Canada, Nutrition for Healthy Term Infants, 1998.

<sup>71</sup> Food Safety Authority of Ireland, Recommendations for a national feeding policy, 1999.

<sup>72</sup> Tonz O et al, Paediatrica, 1997.

<sup>73</sup> Department of Health, London, UK, 1996.

<sup>74</sup> MAFF, London, UK 1996.

<sup>75</sup> Working Group of the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment, 2003, <http://www.food.gov.uk/multimedia/pdfs/2003-03.pdf>.