

NUTRITION PERSPECTIVES

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WHAT CONSUMERS NEED TO KNOW ABOUT VITAMIN E

What is vitamin E?

Vitamin E is a powerful antioxidant that protects the body's cells from oxidation damage caused by “free radicals” that contribute to the development of health problems such as cancer and heart disease. Some researchers speculate that the aging process itself is the result of years of accumulated damage by free radicals.

Free radicals are highly reactive substances that result from normal metabolism and from exposure to environmental factors like cigarette smoke and ultraviolet light. They cause cellular damage by attacking the body's cell membranes, proteins and DNA.

Vitamin E is indispensable for good health. Every cell in the body needs some, but it is especially important in protecting blood cells, the nervous system, skeletal muscle and the retinas of your eyes from free-radical damage.

Vitamin E works with other antioxidants, such as vitamin C and selenium, to help protect the body from damage caused by these free radicals.

What are the forms of vitamin E? Are some better than others?

Vitamin E is a broad term that refers to a family of compounds. There are two groups of vitamin E compounds, the “tocopherols” and the “tocotrienols.” Each of these compounds comes in four slightly different chemical shapes. The names of the shapes (chemists call them “isomers”) are “alpha,” “beta,” “delta,” and “gamma” and the chemical orientation of each compound is designated by “d” or its mirror image “l.”

Alpha-tocopherol is the only form of vitamin E that meets the human requirement. The alpha-tocopherol in food and natural-source supplements is labeled as “d-alpha-tocopherol.” The synthetic form, which is used in many supplements and for fortification of foods, is labeled as “d,l-alpha-tocopherol.” The alpha-tocopherol version is usually combined with an approved food additive, such as acetate, nicotinate, or succinate to prolong the supplement’s shelf life.

Both natural and synthetic alpha-tocopherol is absorbed. Only half of the synthetic form is maintained in the plasma. Thus, the natural form is twice as potent as the synthetic one.

How much vitamin E do you need?

It depends upon many factors. Requirements change with age, gender, and your health status. The amount of vitamin E you need also depends on the amount of polyunsaturated fats you consume, because those types of fats tend to be easily oxidized. If your diet is high in foods containing polyunsaturated fats, such as sunflower oil, safflower oil, corn oil, and high-fat fish (tuna, salmon, and trout), your need for vitamin E increases.

The recommended dietary allowance (RDA) for vitamin E is 15 mg alpha-tocopherol, an amount sufficient to cover the needs of most healthy people. On average, American adults consume about 8 – 12 mg/day of vitamin E through their diet, and obvious vitamin E deficiency rarely occurs in healthy individuals because of dietary shortfalls. The RDA (15 mg) for vitamin E is equivalent to 22 IU of d-alpha-tocopherol (natural form) or 33 IU of d,l-alpha-tocopherol (synthetic form). These levels are different because the natural (d) and synthetic (d,l) forms of vitamin E have different biological and chemical properties.

For the general population, the new vitamin E recommendations also established an upper tolerable level of 1,000 mg of any form of alpha-tocopherol in vitamin E

supplements. This is equivalent to 1,100 IU d,l-alpha-tocopherol or 1,500 IU d-alpha-tocopherol.

What are the possible benefits of vitamin E?

Scientists are beginning to piece together the vitamin E health puzzle. While the potential benefits of vitamin E are very promising, they have not been proven conclusively. And despite all that scientists have learned, much remains unknown and under investigation. Researchers, for example, are now trying to decipher which individuals are most likely to benefit from an increased intake of vitamin E. Among the health-promoting actions attributed to vitamin E is its ability to slow the oxidation of “bad” (LDL) cholesterol, prevent blood clot formation, enhance immune response, and benefit the nervous system. Results from clinical trials and other types of studies suggest that vitamin E may help lower the risk of chronic conditions, such as heart disease, stroke, diabetes, and cataracts.

Do you need supplemental vitamin E?

Because there is insufficient evidence of its benefit, no national scientific bodies have recommended vitamin E supplements. Vitamin E supplements are used in certain medical conditions such as malabsorption.

If you decide to take a vitamin E supplement, be sure to let your primary care provider know because of possible interactions with drugs. Daily doses greater than 1,000 mg [1,100 IU (dl) or 1,500 IU (d)] may cause bleeding disorders in persons taking anticoagulant drugs to thin their blood. While research on higher doses of vitamin E is intriguing, it is still not clear if higher doses are effective or safe for the general population.

How does your diet stack up?

Think about the foods you eat on a typical day. Based on the chart below, are you getting adequate vitamin E in your diet?

You’ll see that the best sources are vegetable oils, such as sunflower, safflower, canola, corn, soybean, and olive oil and foods containing these oils. Nuts (almonds, filberts, Brazil nuts, peanuts, pistachios), sunflower seeds, and wheat germ are good sources, too. Other sources of vitamin E include whole grains, fish, peanut butter, eggs, tomato paste, and sauce and green, leafy vegetables. Most fruits do not contain vitamin E.

Because the richest food sources of vitamin E also tend to be higher in fat, you may be getting less vitamin E, if you are cutting down on fat consumption.

Vitamin E (alpha-tocopherol) Content of Commonly Eaten Foods

FOOD CATEGORY	FOOD	AMOUNT	Alpha- tocopherol in mg
Fats and Oils	Sunflower oil, 60% or more linoleic acid	1 Tbs.	7.0
	Safflower oil, 70% or more linoleic acid	1 Tbs.	6.0
	Cottonseed oil	1 Tbs.	5.3
	Sunflower oil stick margarine	1 Tbs.	3.4
	Canola oil	1 Tbs.	2.9
	Corn oil	1 Tbs.	2.9
	Soybean oil	1 Tbs.	2.5
	Corn oil stick margarine	1 Tbs.	2.2
	Peanut oil	1 Tbs.	1.8
	Olive oil	1 Tbs.	1.7
	Soybean oil stick margarine	1 Tbs.	0.7
	Sunflower oil soft margarine	1 Tbs.	0.7
	Corn oil soft margarine	1 Tbs.	0.7
	Soybean oil soft margarine	1 Tbs.	0.7
Seeds	Sunflower seeds, dry or oil roasted	1 oz. (3 Tbs.)	14.2
Nuts	Almonds, dried	1 oz. (24 nuts)	16.7
	Filberts (hazelnuts), dry or oil roasted	1 oz. (20 nuts)	6.7
	Brazil nuts, dried	1 oz. (8 nuts)	2.1
	Peanuts, dry or oil roasted	1 oz. (20 nuts)	2.1
Nuts continued	Pistachios, dried or dry roasted	1 oz. (47 nuts)	1.4
	Pecans, dried or dry roasted	1 oz. (20 med. halves)	0.8
	Walnuts, dried	1 oz. (14 halves)	0.7
Fish	Flounder, baked	3 oz.	1.6
	Sardines in tomato sauce	1 sardine	1.4
	Salmon sockeye, canned with bone	3 oz.	1.3

FOOD CATEGORY	FOOD	AMOUNT	Alpha-tocopherol in mg
	Tuna, white in water, drained	3 oz.	1.3
Vegetables	Tomato paste	1/2 cup	5.6
	Tomato puree	1/2 cup	3.1
	Avocado, California	1/2 fruit	1.6
	Broccoli, chopped, frozen cooked	1/2 cup	1.5
	Spinach, frozen, cooked	1/2 cup	0.9
Other Foods	Peanut butter, creamy	2 Tbs.	3.2
	Wheat germ, toasted	2 Tbs.	2.6
	Tomato soup with milk	1 cup	2.6
	Pinto beans, canned	1/2 cup	1.1

This information was provided by the Food and Nutrition Science Alliance (FANSA).

The Food and Nutrition Science Alliance is a partnership of four professional societies that have joined forces to speak with one voice on food and nutrition science issues. Member organizations include the American Dietetic Association, the American Society for Clinical Nutrition, the American Society for Nutritional Sciences, and the Institute of Food Technologists. FANSA's combined membership includes more than 100,000 food, nutrition, and medical practitioners and scientists.

As part of its mission, FANSA provides scientific information about topics of interest to the public. FANSA sponsored a task force to review the state of science on vitamin E and prepare a report. The information in this document was derived by Maret Traber, PhD, Linus Pauling Institute, Oregon State University, Corvallis, Oregon 97331-6512 and Jeffrey Blumberg, PhD, FACN, USDA Human Nutrition Research Center, Tufts University, Boston, MA 02111-1524 from the report by FANSA's Task Force on Vitamin E, and the Report (Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids) of the Institute of Medicine, National Academies.

Source: *FANSA*; Press Release; August 2000.

GETTING TO KNOW YOUR GENES—NEW TOOLS FOR CANCER PREVENTION

“It’s important to remember that cancer is a disease of genetic and environmental interaction,” says Dr. Ruth E. Patterson of Seattle’s Fred Hutchinson Cancer Research Center. The environment we expose ourselves to, the foods we eat, the physical activity we do, or the alcohol or tobacco we use, can all work to damage or protect our genetic material. This damage, or mutation, of genetic material could lead to cancer, explains Dr. Patterson.

Different Genes, Different Risks

But different people exposed to the same cancer-causing factors don’t share the same degree of risk. Not everybody who smokes, for example, gets lung cancer. That’s because not everybody is born with the same genetic makeup. Hereditary differences put people at different risks for developing different cancers.

Some hereditary genetic differences raise an individual’s risk by a significant degree. Having an alteration on a so-called “cancer gene,” like BRCA1 or BRCA2 (for BREast CANcer), is an example. Fortunately, these types of genetic differences are rare. Only five to ten percent of cancers can be called hereditary.

The great majority of genetic differences have only a weak effect upon cancer risk. For example, the rate at which people metabolize heterocyclic amines (HCAs) is genetically determined. HCAs are carcinogens that form on meat, chicken, and fish cooked at a high temperature. People who are fast HCA metabolizers may be at an increased risk for colon cancer if they eat a diet high in grilled or fried meats. Such genetic differences put people at different risks for cancer.

A Lot More to Learn

Science has made it possible to find out if a person possesses alterations on certain genes, including the BRCA1 and 2 genes. Smaller hereditary genetic differences are harder to detect. “The science just isn’t there yet,” says Dr. Patterson. “There’s a lot we still don’t know.” As researchers learn more about the human genome, it will become possible to screen for genetic differences that have yet to be identified.

Genetic screening is an important advance. But researchers caution that finding out you have a “cancer gene” doesn’t mean you will, undoubtedly, develop cancer. “The environmental influence on the development of cancer is huge,” says Dr. Patterson. “The results of a genetic screening test should be regarded as a useful tool that lets you know you are at a higher risk for cancer, not as a final decree that you will certainly develop the disease.”

A woman discovering she has a mutated BRCA1 gene, for example, should keep in mind there are many things she can do to lower her risk for breast cancer. She should speak with her doctor about making changes to diet and lifestyle, undergoing more frequent cancer screenings, and possibly, taking a medication like tamoxifen or having preventative surgery.

Likewise, those individuals who find they do not possess a “cancer gene” should realize that most, ninety to ninety-five percent, of cancers can and do arise from environmental influences alone. A healthy diet and lifestyle, like one that the American Institute of Cancer Research (AICR) recommends, can help limit genetic damage and lower the risk for cancer development. According to Dr. T. Colin Campbell, AICR’s long-time scientific advisor, “Even when we know all there is to know about the human genome, the only reasonable way we’ll be able to reduce cancer risk is through diet.”

Source: *AICR Newsletter*; Issue 69; Fall 2000; p. 10.

PHYTOCHEMICAL WATCH—RESVERATROL HELPS PREVENT CANCER, HEART DISEASE

Resveratrol is a substance found in high concentration in the skin of grapes. It has been identified by researchers working with cell cultures and laboratory animals as one of the more promising food-related compounds for cancer prevention. This important phytochemical seems to fight cancer many different ways.

Resveratrol and Cancer Links

Cancer research shows resveratrol working in three ways: blocking the action of cancer-causing agents, inhibiting the development and growth of tumors, and causing precancerous cells to revert to normal.

At the University of Tennessee in Knoxville, Michael F. McEntee, DVM, is using an American Institute for Cancer Research (AICR) grant to study the effects of resveratrol on the early stages of colon cancer. “In the earliest stage, tumors produce high levels of a certain enzyme that is important to their growth. This enzyme production can be inhibited by commonly used nonsteroidal anti-inflammatory drugs (NSAIDs), such as aspirin and aspirin-like compounds. We hope to show that resveratrol can be a more potent and less toxic alternative to NSAIDs in the prevention and cure of early colon cancers,” explains Dr. McEntee.

Other Health Benefits

In addition to its anti-cancer benefits, resveratrol also shows significant promise in controlling heart disease. It works as an antioxidant to help prevent the oxidation and build-up of fatty plaques in blood vessels, and as an anticoagulant, or “blood-thinner,” similar to aspirin.

Research thus far has been limited to cell cultures and animal studies. Therefore, it is unknown if results will be similar in humans. Also unknown is the amount of resveratrol needed to produce beneficial effects.

Select Sources of Resveratrol with Care

Researchers caution against consuming large amounts of resveratrol in supplement form. Resveratrol has a similar molecular structure to estrogen and could have undesirable side effects, including stimulating the growth of breast cancer cells. Reaching a dangerously high level of consumption, however, would be nearly impossible through consuming resveratrol in foods and beverages.

Resveratrol is found in at least 72 different plants, including mulberries and peanuts, but grapes and grape products are the richest sources. One of the best ways to boost your consumption of this important phytochemical is to drink grape juice or eat grapes, especially red or purple varieties. Some is also found in grape jams, purees, and raisins.

Although resveratrol is present in wine (particularly red wine), consumption of alcohol should be approached with care. If you don't drink, don't start. If you do drink alcohol, use moderation. Limit drinks to no more than one a day for women and two for men.

Source: *AICR Newsletter*; Issue 69; Fall 2000; p. 8.

THE NATIONAL HIGH BLOOD PRESSURE INSTITUTE PUBLISHES UPDATE ON HIGH BLOOD PRESSURE IN PREGNANCY

The National High Blood Pressure Education Program (NHBPEP) Coordinating Committee has issued new guidance for clinicians on high blood pressure in pregnancy. The "2000 Working Group Report on High Blood Pressure in Pregnancy" clarifies how to monitor and treat pregnant women who have hypertension prior to pregnancy and those who develop hypertension during gestation. The NHBPEP is coordinated by the National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health. "Hypertension during pregnancy is a serious public health concern," says NHLBI Director Dr. Claude Lenfant. "Identifying and preventing complications can be challenging, particularly because our understanding of the causes of these problems is limited. Our goal is to provide a tool to help clinicians assess, monitor, and manage high blood pressure and related conditions for the health and well-being of both mother and child."

Hypertensive disorders occur in 6 to 8 percent of pregnancies and contribute significantly to serious complications for both the fetus and the mother. Fetal complications include severe growth restriction and death (stillbirth). In addition, hypertensive disorders account for nearly 15 percent of maternal deaths in the United States, ranking second only to embolism as a leading cause. Other complications for the mother can affect kidney, liver, and central nervous system function.

The new report covers the pathophysiology of hypertensive disorders in pregnancy, patient counseling for future pregnancies, and recommendations for future research. Treatments of women with related conditions, such as renal disease, are also addressed.

The report expands upon the NHBPEP's 1997 high blood pressure treatment guidelines and updates its 1990 report on hypertension in pregnancy. Recommendations are based on evidence-based medicine and consensus among leaders in the field. The NHBPEP is a federation of 45 professional, voluntary, and official agencies.

The report stresses the need for clinicians to differentiate between hypertension (blood pressure equal to or greater than 140 mm Hg systolic or 90 mm Hg diastolic) and hypertension with proteinuria (protein in the urine) the strongest indicator of preeclampsia. Preeclampsia is a pregnancy-specific and systemic syndrome that affects the placenta, kidney, liver, and brain. It can develop gradually or appear suddenly, and it can range from mild to severe. In its most severe form, preeclampsia can lead to eclampsia, or maternal seizures, which can result in death.

The 2000 Working Group Report has added the category “gestational hypertension” to its classifications of hypertensive disorders of pregnancy. This term is used on an interim basis to describe women with elevated blood pressure that first appears during midpregnancy without proteinuria; the diagnosis is updated postpartum to either transient hypertension of pregnancy (blood pressure has returned to normal) or chronic hypertension (blood pressure remains elevated).

Other classifications used in the report are:

- Chronic hypertension: Hypertension that is present and observable before pregnancy or diagnosed before the 20th week of gestation.
- Preeclampsia-eclampsia: Hypertension with proteinuria that develops during pregnancy. Preeclampsia superimposed upon chronic hypertension.

The report updates a recommendation on measuring diastolic blood pressure during pregnancy, suggesting that clinicians use K5 (disappearance) of the Korotkoff sound over K4 (muffling). Furthermore, gestational hypertension should be determined on the basis of at least two readings.

The causes of gestational hypertension and preeclampsia remain unknown, and standard screening tests or markers for preeclampsia remain somewhat elusive. However, the report identifies several indicators that point to the possibility of preeclampsia in women without chronic hypertension. These include elevated blood pressure and proteinuria occurring for the first time during pregnancy (after 20 weeks gestation) and rising levels of serum creatinine, uric acid, and transaminase levels.

In contrast to earlier guidelines, edema is no longer recognized as a diagnostic criterion for preeclampsia because it appears in too many normal pregnant women to be discriminant for this condition. In addition, the use of blood pressure increases of 30 mg Hg systolic or 15 mm Hg diastolic is no longer recommended.

Women with preexisting (chronic) or early hypertension are at increased risk of preeclampsia, notes the report, and the prognosis for mother and fetus is worse than in cases in which hypertension first develops during pregnancy. Nearly one in four hypertensive women will develop preeclampsia during pregnancy, typically during midpregnancy. Those who have proteinuria early in their pregnancy are at increased risk for fetal loss and other complications independent of preeclampsia.

Signs of preeclampsia in these women include onset of proteinuria and a sudden increase in blood pressure if hypertension was previously well controlled. However, clinicians may have difficulty distinguishing between changes in blood pressure and early signs of preeclampsia.

“Detecting preeclampsia in women with chronic hypertension can be particularly challenging,” notes Dr. Ray Gifford, Jr., of the Cleveland Clinic Foundation, who chaired the NHBPEP Working Group. “Because the consequences of missing a diagnosis of preeclampsia are dire, we encourage clinicians to overdiagnose if necessary.”

According to the report, most women with chronic hypertension prior to pregnancy have Stage 1 or 2 hypertension (systolic blood pressure of 140 to 179 mm Hg or diastolic blood pressure of 90 to 109 mm Hg). Whenever possible, they should be evaluated before pregnancy to assess the severity of their hypertension and possible organ damage, and counseled as appropriate. Lifestyle changes regarding physical activity, weight loss, and sodium restriction should also be addressed.

Many patients with chronic hypertension may be able to control their blood pressure without medications or with less medication than used prior to gestation. The report suggests that, if needed, however, most anti-hypertensive medications, except angiotensin-converting enzyme inhibitors and angiotensin II receptor agonists, can be used safely during pregnancy.

Management of preeclampsia is based first on preventing maternal complications, and second on encouraging growth and maturation of the fetus and allowing the cervix to prepare for delivery, the only definitive treatment of the condition. The Working Group

Report identifies key indications for delivery in preeclampsia, such as gestational age (equal to or greater than 38 weeks) and low platelet count.

Hypertension and signs of organ dysfunction associated with preeclampsia typically disappear within six weeks of delivery. However, women with early-onset preeclampsia or preeclampsia in more than one pregnancy are more likely to develop hypertension later in life.

The “2000 Working Group Report on High Blood Pressure in Pregnancy” was published as a supplement in the July 2000 issue of The American Journal of Obstetrics and Gynecology. The report can be ordered through the NHLBI Information Center at NHLBIinfo@rover.nhlbi.nih.gov or (301) 592-8573. NHLBI press releases, scientific resources, and other materials are online at <http://www.nhlbi.nih.gov> .

Source: NIH Press Release; Tuesday, October 24, 2000.

UPCOMING CONFERENCES:

CENTER FOR WEIGHT AND HEALTH CONFERENCE ON CHILDHOOD OBESITY

The California Department of Health Services in collaboration with the UC Berkeley Center for Weight and Health is offering a conference on childhood obesity in San Diego, March 19th-20th, 2001. This conference will expand upon issues covered at the Center's first symposium. Emphasis will be on sharing of experiences from a wide variety of programs and discussions of practical implications. There will be plenary sessions featuring renowned researchers as well as numerous breakout sessions that make it possible for participants to choose sessions within their area of interest. Sessions appealing to a wide variety of professionals will be offered so that whether you are an MD in private practice, a government administrator, a researcher or a WIC nutritionist, for example, you will find a session tailored to your needs and concerns offered at each time period.

More information and registration materials will be sent as they are available. Please feel free to share this information with your colleagues.

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For more information please visit the Center for Weight and Health web site at <http://cnr.berkeley.edu/cwh>.

RESOURCES:

WHAT'S NEW IN THE SUPERMARKET?

With the many varieties of milk available today, you may find yourself puzzled over which to choose. But you can benefit from new options.

First, dairy milks have been given new names to make it easier to understand the amount of fat they contain.

- Skim milk is now labeled “fat-free.”
- One percent milk is called “low-fat.”
- Two percent milk is named “reduced-fat.”

Health experts recommend that most people use fat-free or low-fat milk instead of higher fat products.

In addition to the milks you're used to seeing in the dairy case, the following products are easily found today.

Acidophilus Milk

This dairy milk has the bacterium lactobacillus added. The addition of this “healthy” bacterium, which is also found in yogurt, may benefit the body in several ways. Potential advantages include: restoring beneficial bacteria to the intestine when taking antibiotics, preventing yeast infections, and limiting symptoms of lactose (milk sugar) intolerance.

Buttermilk

This milk is not made from butter, but from fat-free or low-fat milk. It has a tart taste because of the lactic acid culture it contains. Some people may enjoy buttermilk as a beverage, but it is more frequently used in recipes for quick breads, muffins, and pancakes. Buttermilk may be better tolerated by people with lactose intolerance than regular dairy milk.

Calcium-enriched Milk

These dairy milks contain added calcium. Look for a fat-free or low-fat variety.

Lactose-reduced Milk

A dairy milk that has a significant amount of its lactose chemically “predigested.” Individuals who have lactose intolerance can use these milks. The broken down sugar molecules in these milks give them a slightly sweeter flavor than regular dairy milks.

Soymilk

This non-dairy “milk” is the liquid pressed out of soybeans. Vegetarians often use it. Soybeans are being studied for their potential health benefits, including heart disease and cancer protection. Soy milk can be used as a substitute in the diet for dairy milk, but be sure to choose a brand fortified with calcium and vitamins A, D, and B12.

And outside of the dairy case, look for nonfat dry milk powder. It comes in handy for recipes and power outages and is easy on the budget. Just reconstitute with water.

Source: *AICR Newsletter*; Issue 69; Fall 2000; p. 9.

HEALTHY EATING RESOURCES WEB PAGES

USDA’s Center for Nutrition Policy and Promotion

<http://www.usda.gov/cnpp/>

Tuft’s Nutrition Navigator

<http://navigator.tufts.edu/>

Mayo Health Oasis

<http://www.mayohealth.org/>

Parent’s Place

<http://www.parentsplace.com/expert/nutritionist/>

Feeding Kids Newsletter

http://www.nutritionforkids.com/Feeding_Kids.htm

Tiny Tummies Online

<http://www.tinytummies.com/>

Meals For You

<http://www.mealsforyou.com/mfy/>

Source: *Nutrition and Your Child*; No 3; 2000; p. 3.

CELEBRATE HEALTHY EATING NUTRITION EDUCATION PACKET

The Dannon Institute has created Celebrate Healthy Eating, a nutrition education packet specifically designed for preschool-aged children. Dannon Institute, Penn State Nutrition Center, and Scholastic Early Childhood Today collaborated in the production of this packet.

To receive a complementary copy of the packet, send an email to dannon.institute@dannon.com or telephone (914) 332-1092. Be sure to indicate that you are requesting a copy of Celebrate Healthy Eating and provide your complete name and mailing address.

This packet has a general theme of spring fruits and vegetables. Its objectives are for children to develop positive attitudes towards food and tasting, improve acceptance of a variety of fruits and vegetables, begin to connect basic ideas about food and health, and develop skills for food preparation. The packet contains components that can be easily incorporated throughout the early childhood program. The packet includes: a four-page teacher guide, a large interactive poster for the classroom, two parent newsletters, classroom activity ideas, and a reproducible storybook for children to color. It is anticipated that three more packets will be produced in 2000-2001.

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