Karrie A. Kalich, Dottie Bauer, and Deirdre McPartlin

# "Early Sprouts"

## Establishing Healthy Food Choices for Young Children

**Four-year-old Tyler and 5-year-old Cole eagerly tear the shiny green leaves of rainbow chard into small pieces to use in today's recipe: Cheesy Chard Squares. Earlier in the week the children harvested some chard from the play-yard garden and cut up the stalks with scissors. They sampled each of the different colors and talked about the similarities and differences.**

**It is late in the harvest season, and while they work, Janet, their teacher, discusses plans for next year's garden with the children. Cole wants to plant tomatoes. Tyler suggests cucumbers. Both children agree they want to grow rainbow chard again. They mix together several eggs, grate the cheese, and combine the ingredients in preparation for baking. Tyler announces, "I'm going to eat these squares for dinner!"**

**The preschool years** are a critical period for the development of food preferences and lifelong eating habits. Between the ages of 2 and 5, children become increasingly responsive to external cues, such as television commercials that use popular cartoon characters to advertise foods, candy in supermarket checkout aisles, and fast-food restaurants offering a free toy with the purchase of a kid's meal. These environmental messages influence children's decisions about what and how much they should eat (Birch & Fisher 1995; Fisher & Birch 1999; Rolls, Engell, & Birch 2000). By the age of 5, most children have lost their innate ability to eat primarily in response to hunger (Rolls, Engell, & Birch 2000; Haire-Joshu & Nanney 2002) and have learned to prefer calorie-rich foods (high fat and high sugar)—foods often used as a reward or for comfort in American society.

Some adults offer children healthy foods, such as fruits and vegetables, in a negative or coercive manner. But vegetables become less appealing if children must finish them prior to having dessert or leaving the dinner table (Birch & Fisher 1996). Using a positive approach to foster healthy eating behaviors helps young children develop lifelong habits that decrease the risk of obesity and other related chronic diseases.

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The authors expand the story of their Early Sprouts project in a new book from Redleaf Press, *Early Sprouts: Cultivating Healthy Food Choices in Young Children.*

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## Nutrition and young children

The current obesity epidemic in the United States is a fast-growing public health concern. For preschool-age children the prevalence of obesity has more than doubled in the past 30 years (CCOR 2006). Traditionally, early childhood educators have focused on the importance of meeting young children's nutritional requirements (Marotz 2009). With the increase in childhood obesity, there is a new call to early childhood educators to guide children and families in developing healthy eating and activity habits.

What we know now is that a diet rich in fruits and vegetables is recommended for achieving or maintaining a healthy body weight. The USDA (U.S. Department of Agriculture) recommends that preschool-age children eat 3 to 5 half-cup servings of vegetables and 2 to 4 half-cup servings of fruit daily (www.mypyramid.gov). However, on the average, preschool children consume approximately 2 servings of vegetables and 1.5 servings of fruit each day. Their diets are typically low in fruits, vegetables, and whole grains and high in saturated fat, sodium, and added sugar (Enns, Mickle, & Goldman 2002; Guenther et al. 2006). In fact, studies have consistently shown that the diets of U.S. children do not meet national dietary recommendations (Gleason & Suitor 2001; U.S. Department of Health and Human Services & U.S. Department of Agriculture 2005). While children ages 2 to 5 have somewhat better diets than older children, their diets still need improvement to meet the 2005 *Dietary Guidelines for Healthy Americans* (Fungwe et al. 2009).

**Children's gardens provide an ideal setting for nutrition education by allowing children to observe and care for plants and develop a connection to the natural world.**

## Role of early education in improving the diets of young children

Early childhood educators have the opportunity to improve children's food choices because they interact with children daily (Birch & Fisher 1998). Family members and teachers can influence the food preferences of young children by providing healthy food choices, offering multiple opportunities to prepare and eat new foods, and serving as positive role models through their own food choices.

Children's preference for vegetables is among the strongest predictors of vegetable consumption (Birch 1979; Domel et al. 1996; Harvey-Berino et al. 1997; Morris & Zidenberg-Cherr 2002). Sullivan and Birch (1994) found that it takes 5 to 10 exposures to a new food for preschool children to become comfortable and familiar with its taste and texture. When children have repeated opportunities to taste a new food, they often change their food reactions from rejection to acceptance (Birch & Marlin 1982; Sullivan & Birch 1994).

Children's gardens provide an ideal setting for nutrition education by allowing children to observe and care for plants and develop a connection to the natural world (Subramaniam 2002; Lautenschlager & Smith 2007). Children exposed to homegrown produce tend to prefer those vegetables (Nanney et al. 2007). Some early childhood garden projects also focus on caring for the environment and science education (Perkins et al. 2005; Nimmo & Hallett 2008). Other nutrition education approaches for young children feature tasting exotic fruits and vegetables (Bellows & Anderson 2006). As more educators bring gardening and nutrition projects into their classrooms, there is a need for additional teacher support and curriculum development (Graham et al. 2005).

## The Early Sprouts program: An overview

Early Sprouts is a research-based nutrition and gardening curriculum for the preschool years, created by Karrie Kalich and developed in collaboration with the Child Development Center at Keene State College in New Hampshire. We designed the curriculum to encourage children's food preferences for six selected vegetables (bell peppers, butternut squash, carrots, green beans, Swiss rainbow chard, and tomatoes) and increase their consumption of these vegetables (Kalich, Bauer, & McPartlin 2009). The program's scope includes planting raised organic garden beds, sensory and cooking lessons focused on the six vegetables, training and support for classroom teachers, and family involvement.

Through the curriculum we help children overcome an innate food neophobia (*fear of new foods*) through multiple exposures to the six vegetables. Additionally, the Early Sprouts model provides a "seed to table" experience by following the lifespan of the vegetables. The garden features six vegetables that represent a variety of colors and plant parts and are easy to grow in our region (New England), available at farmers' markets, and affordable and available year-round in supermarkets.

One project goal is to expose the children to the six vegetables multiple times over the course of the 24-week curriculum. In preparation for the

Photos © Karrie A. Kalich

project, we developed recipes for cooking snacks and meals using the vegetables. The Early Sprouts recipes include a variety of healthy ingredients: low-fat dairy products, healthy fats (canola and olive oils), whole grains (stone-ground cornmeal and whole wheat flours), and reduced amounts of sodium and sugar as compared to commercially available snack products.

Based on feedback from field-testing among teachers and children in our program, we chose 24 recipes (four per vegetable). We adapted the recipes for classroom use and for family use in the Family Recipe Kits component of the project. Each recipe has an accompanying sensory exploration activity that features the same vegetable and involves children in exploring the plant parts by using all of their senses.

We begin the Early Sprouts project at each site by building raised garden beds on the playground and filling them with alternating layers of compost, humus, and topsoil. To ensure children's health and safety, we practice organic gardening techniques, such as using only organic fertilizers and hand-picking garden pests. With the groundwork complete, teachers implement the healthy food curriculum in their preschool classrooms.

## How the Early Sprouts program works

The program begins when children help plant seeds and seedlings in late May and early June. This is followed by watering, weeding, watching, and waiting. After months of anticipation, the children harvest the vegetables from July through early October; thus they observe the complete growing cycle. The children make many discoveries.

**The children are in the playyard garden at harvest time. Janet, the preschool teacher, asks Rachel, age 4½, what she thinks the Swiss chard will taste like. Rachel pauses, then she speculates, "It will taste like nachos." She spontaneously takes a bite of the Swiss chard directly from the garden and then corrects herself, proclaiming, "It tastes more like celery!"**

Each week the curriculum introduces one of the six vegetables. By the end of the entire curriculum, each vegetable has been featured four times. At the start of the week, the children use their senses to explore the vegetable. This exploration is followed by a cooking activity featuring an Early Sprouts recipe. At the end of the week, the children pack a Family Recipe Kit containing the recipe, tips for cooking with children, and many of the necessary ingredients to take home. The purpose of the kit is to help families reinforce the food preparation and healthy eating experience children have had at preschool. Here is one example:

**Cooper, a cautious 3½-year-old, is hesitant to try any of the Early Sprouts vegetables but thoroughly enjoys all of the sensory and cooking activities. He almost never misses an Early Sprouts activity and spends time in the garden almost daily. His interest in the vegetables continues throughout the 24-week experience, but so does his hesitancy to taste the vegetables. About five weeks before the end of the program, Cooper starts to cautiously lick the vegetables. Three weeks later, he tastes them. By the last two weeks, he has developed into a true vegetable lover. His family says that he requests and eats several vegetables a day.**

## Sensory exploration

The sensory exploration experiences safely introduce children to each vegetable. Their familiarity increases as they smell each vegetable, feel the shape and texture, touch its leaves and stalks, shake it and listen for sounds, and notice how it looks before tasting the raw food or the results of the prepared recipe.

Photo © Karrie Kalich

**Jackson, Caitlin, and José, all enrolled in an older preschool group, enthusiastically gather red, yellow, and green bell peppers. Janet, the teacher, guides each of the children in cutting open their peppers and exploring the seeds. José quickly asks if they can taste them. Each child cuts a piece of pepper and tastes it. Caitlin wants to taste the other colors. The children cut and share pieces of their peppers. Janet and the children discuss the various characteristics of the bell peppers, using vocabulary such as *crunchy, juicy,* and *smooth*. When they finish, the children describe the peppers' characteristics and agree they enjoy all the different colored peppers.**

**The sensory exploration experiences safely introduce children to each vegetable.**

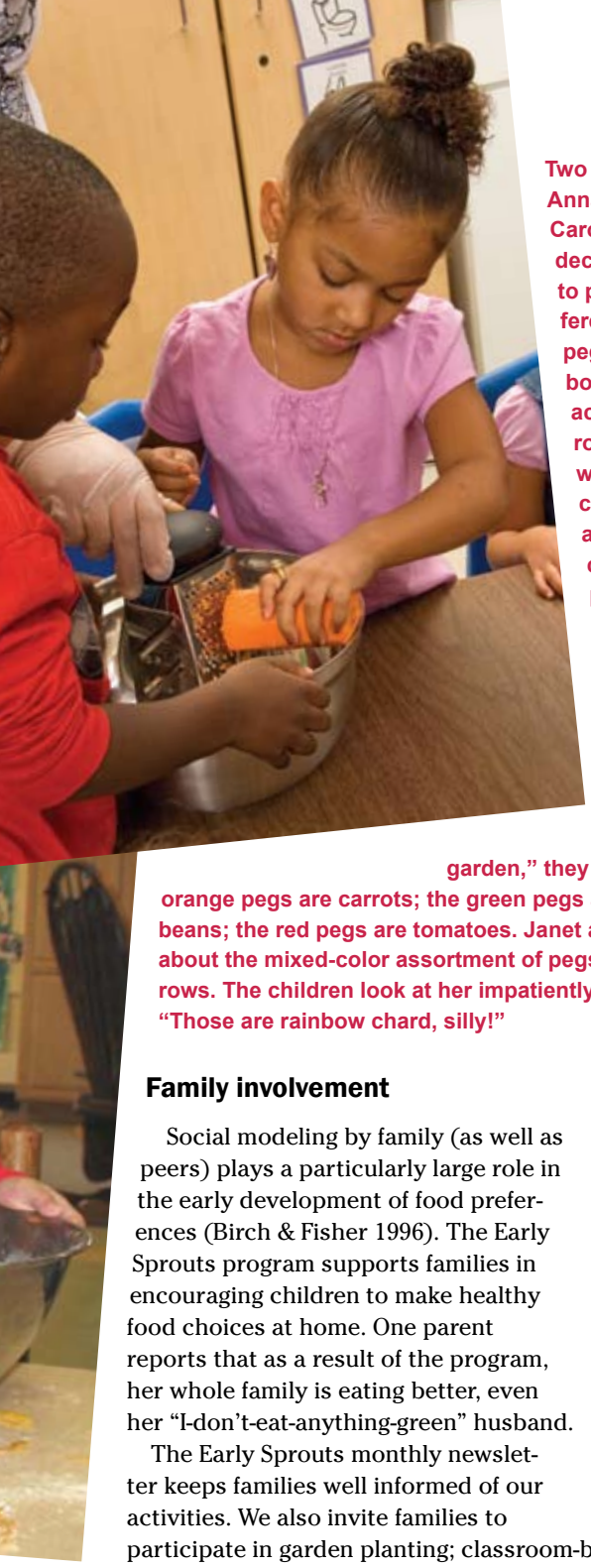
Photos © Mark Corliss

## Cooking

After children explore and taste a vegetable in its raw form, most are eager and willing to participate in the cooking and tasting process. Teachers encourage the children to perform each step of the recipe preparation as is developmentally appropriate—measuring, cutting (with safe tools), mixing, and preparing the food for serving.

**Children eagerly join Janet at the table after washing their hands. Janet helps them identify all the ingredients for making muffins. They use child-size table knives to dice the peppers and plastic graters to grate the cheese. Janet watches 5-year-old Jermaine as he breaks and mixes the eggs, while guiding 3½-year-old Thomas and 4-year-old Jocelyn in measuring and mixing the dry ingredients. All the children count to 10 as they take turns mixing the wet and dry ingredients.**

Cooking experiences connect the Early Sprouts project to other curriculum areas, such as math, science, literacy, and social skills development (Colker 2005).



Two 5-year-olds, Annabelle and Carolyn, are deciding where to place the different colored pegs on the peg board. From across the room, Janet watches the children and admires their cooperative play. After a few minutes, she approaches and sees the girls using many colors. "We're planting a garden," they explain. The orange pegs are carrots; the green pegs are green beans; the red pegs are tomatoes. Janet asks them about the mixed-color assortment of pegs in one of the rows. The children look at her impatiently and exclaim, "Those are rainbow chard, silly!"

### Family involvement

Social modeling by family (as well as peers) plays a particularly large role in the early development of food preferences (Birch & Fisher 1996). The Early Sprouts program supports families in encouraging children to make healthy food choices at home. One parent reports that as a result of the program, her whole family is eating better, even her "I-don't-eat-anything-green" husband.

The Early Sprouts monthly newsletter keeps families well informed of our activities. We also invite families to participate in garden planting; classroom-based sensory and cooking activities; food-based special events, such as the Stone Soup luncheon (made from the Early Sprouts vegetables); and a family nutrition education program. One father comments, "I used to battle with my child about eating vegetables. Now he requests specific vegetables at the store and at mealtimes."

The weekly Family Recipe Kits, which children help to pack, promote family-oriented nutrition education. They contain all needed ingredients and instructions to re-create the week's featured recipe with their child at home. The family experience reinforces the classroom activity and provides another opportunity for the child to taste the vegetable. At the end of the year, families receive a cookbook containing all of the Early Sprouts recipes. Through our weekly program surveys, parents tell us their stories.

> Sydney, the mother of two Early Sprouts participants, writes, "On Friday we brought home this week's kit, and, as usual, my oldest child, Ava, excitedly asked about the contents. When I told her it was butternut squash pancakes, she wrinkled her nose and said she would not eat them. Of course Clay, the youngest and a finicky eater, turned his nose up too.
>
> Sunday morning the children begged for "normal pancakes" but I told them that we were making the Early Sprouts pancakes. Three-year-old Clay wanted to help but kept saying he would not eat the squash. As the pancakes were cooking, Ava came to the stove and asked to see what they looked like. I ate the first (Yummy!), put the second on Clay's plate, and kept cooking. Then Ava said she wanted some too. Both children ate the pancakes. Their only comments were, "How soon until the next one?" and "He (she) got more pancakes."
>
> Sydney described the pancakes as "delicious and so easy to make." She wrote, "I did not even serve them with syrup! My only complaint—they were so good I only got two pancakes! I feel good about serving them. I LOVE THIS PROGRAM! These are the only pancakes we will eat from now on!"

**Cooking experiences connect the Early Sprouts project to other curriculum areas, such as math, science, literacy, and social skills development.**

### Involving teachers and staff

Training professional and volunteer staff is important to the ongoing success of the Early Sprouts project. Because some adults are unfamiliar with the six vegetables and unsure about how to introduce them to the children, we provide detailed background sheets for each vegetable. We post guidelines in the classrooms to encourage staff and volunteers to serve as positive role models during snack and mealtimes when serving the vegetables and presenting new recipes (see "Early Sprouts Tasting—Suggestions for Teachers and Volunteers," p. 54). One experienced teacher even commented, "I know it is important to teach our children about nutrition, but I was never really sure how to do that before Early Sprouts."

## Early Sprouts: What we have learned

A strong research component supports the Early Sprouts program and has evaluated the impact of the curriculum on the eating habits of young children and their families. At the start, midpoint, and conclusion of the 24 weeks of sensory

exploration and vegetable recipes, we measure children's preferences for the program's vegetables as well as dietary changes observed by families at home. At the conclusion of the program, children are more willing to taste the Early Sprouts vegetables and express a greater preference for the six vegetables highlighted. Teachers describe a greater personal confidence in guiding young children in the development of healthy eating behaviors.

## Ways to adapt Early Sprouts at your center

The Early Sprouts model can be easily adapted to other geographic regions. When selecting vegetables for your area, consider the available space, the length of the growing season, rainfall levels, and soil type. If outdoor space is limited, try container or window-box gardening, with dwarf cherry tomato plants, greens, or pole beans. Local greenhouses, community garden associations, community-supported agriculture programs, cooperative extension offices, and garden shops have information and are potential partners. There are many ways to engage children and families in a seed-to-table experience that is appropriate for your setting and location. Visit the Early Sprouts Web site (www.earlysprouts.org) for more information. We encourage you to be creative and innovative in your approach to using the Early Sprouts model. We change and grow ourselves!

## Early Sprouts Tasting—Suggestions for Teachers and Volunteers

- Taste a portion of the Early Sprouts snack. Children will be more willing to try the new snack if you are eating with them and model how to try new foods.
- Invite children to serve themselves from a common bowl, first taking just one helping. Offer a second helping once the children have finished the first one.
- Be a positive role model and adventurous about trying new foods. The goal in providing recipes is to introduce foods creatively and engage all children in trying at least one bite.
- Share your enthusiasm and positive comments if you like the Early Sprouts snack. Even if you do not especially enjoy the snack, let your comments express that it sometimes takes multiple tries to become accustomed to a new food. Explain that we want to give ourselves and the food a chance.
- Compliment the children on their preparation of the snack. Many of them participated in the activity. Thank them for their work and for making delicious food.
- Ask the children to explain how they made the food (the ingredients needed, the stirring, measuring, and so on). They will be eager to talk about what they did to follow the recipe.
- Engage the children in a pleasant conversation about the things they did in cooking, surprises they may have had, and what they'd like to cook next. Discourage negative criticism but invite suggestions for ways to vary the recipe another time. Talk about why we want to respect the feelings of friends and teachers who prepared the food.

**Janet has hosted a Stone Soup luncheon for 10 years with children and families during the harvest season. In the past, children brought vegetables from home to contribute to the soup. The luncheon is a great family event. But the downside has been that the children rarely would eat or even taste the soup.**

**Now, with the Early Sprouts program, Janet notices that the children contribute many more vegetables and are especially focused on bringing in the Early Sprouts vegetables. Families have more interest because they feel involved in the cooking process. At the luncheon, almost all of the children eat the soup, and many request a second and even a third serving. They also eat up all the Confetti Corn Muffins baked to go with it.**

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