

Growing and Cooking Fruits and Vegetables at Childcare Centers

Local Foods: Childcare Center Production Gardens

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This publication summarizes the benefits of fruit and vegetable gardening with children. It includes age-appropriate activities for childcare providers to engage young children in using fresh produce from a production garden for cooking and eating. This is the first of eight publications about childcare center production gardens.

Early childhood educators have an important opportunity to help create positive environments that connect with young children's senses, allowing them to plant, grow, harvest, and ultimately prepare healthy eating experiences. Children develop healthy eating habits and food preferences at an early age. The more engaged children become with hands-on food education, such as gardening and food preparation, the more likely they will prefer and routinely consume fruits and vegetables.^{1, 2, 3, 4}

Findings of the Natural Learning Initiative (NLI) Preventing Obesity by Design (POD) program emphasize the significance of gardening for engaging teachers and children in on-site food production.⁵ By incorporating a designated production garden in the outdoor learning environment, childcare centers can inspire lifelong healthy eating habits and can become models for the families they serve.

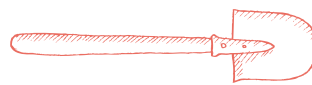
The Centers for Disease Control and Prevention (CDC) recommend a diet high in fruits and vegetables to lower risk for numerous chronic illnesses, including cancer and cardiovascular disease.⁶ For most Americans two years and older, specifically preschool age children, vegetable intake falls below CDC recommendations.^{7, 8} Natural Learning Initiative (NLI) Preventing Obesity by Design (POD) childcare centers recognize

that a well-balanced eating plan containing fruits and vegetables can help children maintain a healthy weight.⁹ These centers have embraced and integrated growing, harvesting, and cooking with children into their daily curriculums.

GARDENING AND COOKING ABILITIES OF YOUNG CHILDREN¹⁰

Classroom activities based on experiences with growing and cooking fruits and vegetables can help young children learn key developmental skills, including:

- **Science skills:** classification, weather, insects, soil, and plant life cycles.
- **Math skills:** counting, measuring, and weighing.
- **Language skills:** describing and comparing color, taste, and texture.
- **Fine motor skills:** mixing, spreading, and chopping.
- **Cognitive skills:** curiosity, cause-and-effect, and problem-solving.



Why is exposure to growing and cooking fruits and vegetables important for young children?

- *Dietary Guidelines for Americans* recommend at least two servings of both fruits and vegetables each day.
- Essential vitamins, minerals, and fiber provided by fruits and vegetables may help prevent chronic diseases.
- Growing, preparing, and eating fruits and vegetables, from their own gardening efforts, can help children develop lifelong healthy eating habits.
- Participating in a full range of gardening from seed to tummy helps children understand the origins of food.



Little fingers loosening roots before planting.

Young children are curious and highly motivated to learn new skills like gardening and cooking. With adult encouragement in a safe, carefully prepared, and supervised environment, growing and cooking abilities can advance rapidly, aligned with age-appropriate activities:

APPROPRIATE ACTIVITIES FOR TWO-YEAR-OLDS INCLUDE:

Gardening

- *pushing* child-size wheelbarrows
- *watering* plants with help from a teacher
- *pushing* large seeds, such as beans and peas, into the soil
- *observing* insects and ripening produce

Cooking

- *scrubbing* vegetables and fruits
- *carrying* (unbreakable) items to the table
- *dipping* foods
- *washing* and *tearing* lettuce and salad greens
- *breaking* bread into pieces

APPROPRIATE ACTIVITIES FOR THREE-YEAR-OLDS INCLUDE:

Gardening

- *mixing* soil to prepare garden beds
- *planting* large seeds and seedlings
- *filling* up watering cans
- *watering* plants
- *pulling* weeds
- *observing* plant growth
- *comparing* leaf shapes
- *describing* appearance of fruits and vegetables

Cooking

- *pouring* liquids into batter (measured first)
- *mixing* batter or other dry and wet ingredients together
- *shaking* a drink in a closed container
- *spreading* butters or other spreads
- *kneading* dough
- *washing* vegetables and fruit
- *serving* foods
- *placing* things in the trash after cooking or after a meal

APPROPRIATE ACTIVITIES FOR FOUR- AND FIVE-YEAR-OLDS INCLUDE:

Gardening

- *shoveling* compost and mulch
- *raking* soil to prepare garden beds
- *planting* small seeds and seedlings
- *harvesting* ripe produce
- *training* and *weaving* vines onto a trellis or fence
- *collecting* seeds
- *filling* up watering cans
- *watering* plants
- *pulling* weeds
- *identifying* garden insects
- *weighing* produce
- *comparing* shapes and sizes of produce
- *observing* insects and birds
- *drawing* garden scenes or items

Cooking

- *juicing* oranges, lemons, and limes
- *peeling* some fruits and vegetables (bananas and even onions)
- *mashing* soft fruits and vegetables
- *scrubbing* vegetables (potatoes, mushrooms)
- *cutting* soft foods with a plastic knife (mushrooms, hard-boiled eggs)
- *pressing* cookie cutters
- *measuring* dry ingredients
- *cracking* and *breaking* open eggs
- *beating* eggs with an egg beater
- *stirring* ingredients together
- *setting* the table
- *wiping* up after cooking
- *clearing* the table after a meal

Utensils required:

- Plastic cutting board
- Plastic knives for cutting
- Plastic measuring cups
- Stainless-steel or plastic bowls for mixing
- Plastic or wooden spoons for mixing

Children's books about gardening and cooking:

Muncha! Muncha! Muncha! by Candace Fleming, Atheneum Books for Young Readers, 2002

Plant a Little Seed by Bonnie Flemming, Roaring Book Press, 2012

Two Old Potatoes and Me by John Coy, Nodin Press, 2013

Growing Vegetable Soup by Lois Ehlert, HMH Books for Young Readers, 1987

How Groundhog's Garden Grew by Lynne Cherry, Blue Sky Press, 2003

Garbage Helps Our Garden Grow: A Compost Story by Linda Glaser, Millbrook Press, 2010

Grow It Cook It: Simple Gardening Projects and Delicious Recipes, DK Publishing, 2008

Rainbow Stew, by Cathryn Fallwell, Lee & Low Books, 2013

Child and Adult Care Food Program (CACFP) and local food

If your childcare program participates in the Child and Adult Care Food Program (CACFP), you can use the funds for things like purchasing food from farmers' markets and planting edible gardens. Costs associated with growing food to be used in the meal service are allowable. These costs include such items as seeds, fertilizer, labor, and plot rental. See *CACFP Financial Management Guide*.¹¹



Pushing a seed into the soil of a raised planter.

TIPS FOR ENGAGING KIDS IN COOKING
(ALSO SEE PUBLICATIONS LF-007-05
AND LF-007-06 IN THIS SERIES)

- Create a fun and nurturing environment where children have many opportunities to see, touch, smell, and taste the fruits and vegetables they have grown in the garden.
- Focus on seasonal fruits and vegetables being harvested from the garden, those available locally in season, or both. (Also see publications LF-007-03 and LF-007-04 in this series.)
- Model tasting new foods. Children are likely to follow an adult example.
- Encourage children to taste the raw product first, then to taste the cooked product, reminding children that it may take multiple tastings to get used to new foods.
- Encourage young children to say “no thank you” when they do not like a new food, rather than “yucky” or another negative word. “Don’t yuck my yum!”
- Supplement harvest from the garden with items from the local farmers market when there is not enough for everyone to enjoy from the on-site garden.
- Make enthusiastic and positive comments about the taste and texture of the new food.

- Compliment and thank children for their care and attention in preparing the delicious food items.
- Lead a positive discussion about the food, including its taste, texture, smell, and color. Discuss how the food was prepared. Ask the children about the ingredients, the recipe, steps taken, and utensils used.
- Discuss appropriate serving sizes, which are smaller than for adults.¹²
- Read children’s books that include cooking and gardening activities that can be referenced in the classroom (see sidebar, p.2).

SAFETY PRECAUTIONS

Take special care with food safety.¹³ As immune systems are still developing, children are more susceptible to foodborne illnesses than healthy adults. Establish a rule that children thoroughly wash their hands after gardening, after using the toilet, before and after handling food, and whenever hands get dirty. Teach the following hand-washing protocol:

- Wet hands with clean running water (warm or cold) and apply soap.
- Rub hands together to make lather and wash them well, including backs of hands, between fingers, and under nails.
- Rinse hands well under running water.
- Dry hands using a single-use towel.

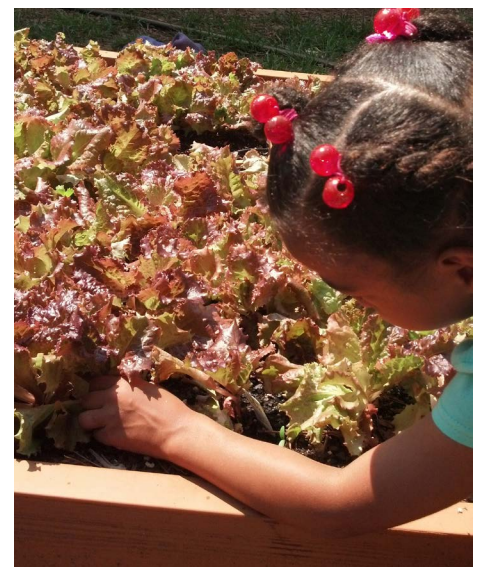
**About the Local Foods series:
Childcare Center Production Gardens**

This publication in the Local Foods series is the first of eight publications about childcare center production gardens:

1. [Growing and Cooking Fruits and Vegetables at Childcare Centers](#) (LF-007-01)
2. [Creating Childcare Center Production Gardens](#) (LF-007-02)
3. [Growing Warm-Season Fruits and Vegetables in Childcare Production Gardens](#) (LF-007-03)
4. [Growing Cool-Season Vegetables in Childcare Production Gardens](#) (LF-007-04)
5. [Snacking and Cooking with Warm-Season Produce from Childcare Production Gardens](#) (LF-007-05)
6. [Snacking and Cooking with Cool-Season Produce from Childcare Production Gardens](#) (LF-007-06)
7. [Composting in Childcare Production Gardens](#) (LF-007-07)
8. [Vermicomposting in Childcare Production Gardens](#) (LF-007-08)



Gardeners working together to plant their summer garden.



Harvesting lettuce for a fresh salad.

REFERENCES

- 1 Birch, L.L., McPhee, L., Shoba, B.C., Pirok, E., Steinberg, L. (1987). What kind of exposure reduces children's food neophobia? Looking vs. tasting. *Appetite* 9:171–178.
- 2 Hermann, J.R., Parker, S.P., Brown, B.J., Siewe, Y.J., Denney, B.A., Walker, S.J. (2006). After-school gardening improves children's reported vegetable intake and physical activity. *J. Nutr. Educ. Behav.* 38: 201–202.
- 3 Langellotto, G.A., Gupta, A. (2012, August). Gardening increases vegetable consumption in school-aged children: A meta-analytical synthesis. *HortTechnology* 22(4): 430–445. <http://horttech.ashspublications.org/content/22/4/430.full>
- 4 Lineberger, S.E., Zajicek, J.M. (2000). Can a hands-on teaching tool affect student's attitudes and behaviors regarding fruit and vegetables? *HortTechnology* 10:593–597.
- 5 Moore, R.C., Cosco, N. (2014). Growing up green: Naturalization as a health promotion strategy in early childhood outdoor learning environments. *Children, Youth and Environments* 24(2): 168-191.
- 6 Centers for Disease Control and Prevention. (2008). Improve your health while enjoying the season's colorful produce. Atlanta, GA: CDC. http://www.cdc.gov/nccdphp/dnpa/nutrition/nutrition_for_everyone/fruits_vegetables/spotlight.htm
- 7 U. S. Dept. of Agriculture, U. S. Dept. of Health and Human Services. (2010). Dietary guidelines for Americans. 7th ed. Washington, DC: U.S. Govt. Printing Office. <http://www.health.gov/dietaryguidelines/dga2010/DietaryGuidelines2010.pdf>
- 8 Enns, C.W., Mickle, S.J., Goldman, J.D. (2002). Trends in food and nutrient intake by children in the United States. *Family Economics and Nutrition Review* 14 (2): 56–69.)
- 9 Centers for Disease Control and Prevention. (2012). How to use fruits and vegetables to help manage your weight. Atlanta, GA: CDC. http://www.cdc.gov/healthyweight/healthy_eating/fruits_vegetables.html
- 10 California Dept. of Public Health, Women, Infants and Children Program. (2015). Cooking abilities of young children. Sacramento: State of California.
- 11 U.S. Dept. of Agriculture—Food and Nutrition Service. Financial management: Child and Adult Care Food Program. Gardens and nutrition education (p. 111). Procurement (p. 152). Alexandria, VA: USDA. <http://www.health.gov/dietaryguidelines/dga2010/DietaryGuidelines2010.pdf>
- 12 Hayes, D. (2014, Feb. 4). Step-wise nutrition for young children. Chicago, IL: Academy of Nutrition and Dietetics. <http://www.eatright.org/resource/food/nutrition/dietary-guidelines-and-myplate/size-wise-nutrition-for-preschool-age-children>
- 13 Chaifetz, A., Driscoll, L., Gunter, C., Ducharme, D., Chapman, B. 2012. Food safety for school and community gardens. A handbook for beginning + veteran garden organizers: Reducing food safety risks. Raleigh: NC Cooperative Extension, NC State Univ. <https://growingsafegardens.files.wordpress.com/2012/10/foodsafetywebcurriculum-10-24-12.pdf>

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