

Nutrition and Cognitive Development

Cognitive development refers to human perception, thinking, and learning. Nutrition, genes, and experiences work together to affect a child's cognitive development. Many research studies have identified the importance of nutrition in learning. Interactions with other people and objects are also important for brain development.

Let's review some recent research findings that show how nutrition impacts brain development.

- Many studies have shown that lack of basic nutrients before and during pregnancy can affect brain development in infancy and childhood. For example, adequate intake of essential fats is important for the brain development of the fetus. Folic acid intake is also important for development of the brain and nervous system. Proper nutrition before and during pregnancy is a first step in supporting brain development of the child (Hawley, 2000; Mendoza-Salonga, 2007; and Uuay & Dangour, 2006).
- Studies have shown that breastfeeding may improve cognitive development of children (Kramer et al., 2008).
- Malnutrition in infancy and childhood can affect development and behaviors. Regularly consuming an inadequate diet can affect critical development stages including parent-child interaction, attachment, play, and learning (Schyuler Center for Advocacy, 2006).
 - Iron is important for growth, learning, and energy to play. Iron deficiency anemia can affect cognitive development. A recent study showed that iron deficiency anemia may affect development of gross motor skills and social skills (Beard, 2008). Meats, poultry, fish, and dried beans are good sources of iron.



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Poor nutrition makes it harder for children to fight off infection (Scrimshaw & San Giovanni, 1997).

- Iodine deficiency during pregnancy and the early years of life interferes with normal brain development. This problem is rarely seen in the United States due to intake of iodized salt (Zimmerman et al., 2006).
- Fat is important for brain development. Breastmilk and formula are good sources of fat for infants. Whole milk is a good source of fat after age 1. Children can begin to drink lowfat milk starting at age 2 (Dietz & Stern, 1999; NFSMI, 2009).



Studies have shown that breakfast eating can support learning in children. Skipping breakfast is relatively common among children in the United States (Murphy, 2007). Child care providers can encourage children to eat breakfast throughout their childhood by

- ❖ providing breakfast in child care,
- ❖ giving children positive experiences with breakfast, and
- ❖ teaching parents the importance of eating breakfast.

Child care providers have an important role in meeting the nutrient needs of children. When menus follow the Child and Adult Care Food Program (CACFP) Meal Pattern requirements, nutrients and energy needs of children are supplied. Child care providers can work together with parents to meet the nutrient needs of children.

Parents and child care providers can:

1. Teach children to eat a variety of foods. Offer a variety of fruits and vegetables. Teach children about the food groups and why each is important.
2. Offer healthy, new foods in small amounts. Offer new foods alongside familiar foods.
3. Be good role models! Eat a variety of healthy foods and children are more likely to want to try them, too.
4. Emphasize breakfast. Teach children that just like a car needs gas to get started, our bodies need fuel to get started each day. Eating breakfast gives our brains the energy we need to start learning.



Recipe to Try

Consider serving these tasty Chicken Burritos D-30 with Mexicali Corn I-15 from *USDA Recipes for Child Care*.

Chicken Burrito D-30¹

Raw diced chicken	2 lb 6 oz
Fresh onions, chopped	¼ cup 3 Tbsp
OR	OR
Dehydrated onions	¼ cup
Granulated garlic	1 ½ tsp
Ground black or white pepper	½ tsp
Canned tomato paste	1 ½ cups 1 Tbsp
Water	3 cups
Chili powder	2 Tbsp
Worcestershire sauce	1 Tbsp 1 tsp
Salt	2 tsp
Ground black or white pepper	1 tsp
Ground cumin	2 Tbsp
Paprika	1 ½ tsp
Onion powder	1 ½ tsp
Salt	1 ½ tsp
Coriander (optional)	1 ½ tsp
Reduced fat Cheddar cheese, shredded	1 qt ¾ cups
Enriched flour tortillas (at least 0.9 oz each)	25 each



Cook the diced chicken over medium heat until no longer pink, about 10–15 minutes. Stir occasionally. Drain. Add onions, granulated garlic, pepper, tomato paste, water, chili powder, cumin, paprika, onion powder, salt, and coriander (optional). Blend well. Simmer, covered, for 30 minutes. Stir shredded cheese into chicken mixture. Steam tortillas for 3 minutes or until warm, or place tortillas in a warmer to prevent torn tortillas when folding. Portion chicken mixture with No. 12 scoop (½ cup) onto each tortilla. Fold tortilla around meat envelope style. Place folded burrito, seam side down, on two half-sheet pans (13 x 18 x 1 inch) which have been lightly coated with pan release spray, 12–13 burritos per pan. Bake the burritos. Conventional oven: 375 °F for 15 minutes; Convection oven: 325 °F for 15 minutes.

Number of servings: 25

Serving size: 1 burrito provides the equivalent of 2 oz cooked lean meat, ¼ cup of vegetable, and the equivalent of 1 slice of bread.

¹*USDA Recipes for Child Care*. Available online at www.nfsmi.org.

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Breakfast Menus

Monday	Tuesday	Wednesday	Thursday	Friday
Grape halves Toast with margarine Milk	Banana slices Muffin Square A-11 ¹ Milk	Orange sections Cut Biscuit A-09 ¹ Milk	Pear slices Oatmeal Milk	Mixed fruit Unsweetened whole-grain cereal variety Milk

Lunch Menus

Monday	Tuesday	Wednesday	Thursday	Friday
Beef and Spaghetti Casserole D-03 ¹ Pineapple tidbits Milk	Hummus with pita wedges Stir-Fry Vegetables I-10 ¹ Strawberry slices Milk	Chicken Burrito D-30 ¹ Apple slices Milk	Hamburger patty on whole-grain bun Shredded lettuce and tomato slice Apricot halves Milk	Roasted chicken Bean and Barley Soup ² Corn Muffin Squares A-02A ¹ Milk

Snack Menus

Monday	Tuesday	Wednesday	Thursday	Friday
Cheddar cheese Graham crackers Water ³	Carrot sticks and broccoli trees ⁴ with reduced fat dressing Cheddar cheese Water ³	Banana Muffin A-04 ¹ Milk Water ³	Fruit kebob with pineapple and apple cubes Lowfat yogurt, plain Water ³	Banana slices dipped in peanut butter ⁵ and sprinkled with granola Water ³

¹USDA Recipes for Child Care. Available online at www.nfsmi.org.

²5 a Day Quantity Recipe Cookbook. Available online at www.ed.state.nh.us/education/doe/organization/programsupport/bnps/cookbook.pdf.

³Water is suggested as a beverage for all snacks even when other beverages are offered to encourage children to drink water.

⁴Lightly steaming carrots and broccoli may make them easier to eat for small children.

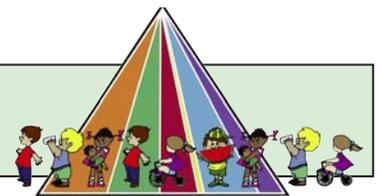
⁵Sunflower butter can be substituted for peanut butter.

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Sources

- Beard, J. L. (2008). Why iron deficiency is important in infant development. *Journal of Nutrition*, 138, 2584-2536.
- Dietz, W. H., & Stern, L. (Eds.) (1999). *American Academy of Pediatrics Guide to Your Child's Nutrition*. New York: Villard.
- Institute of Medicine. (2005). *Preventing childhood obesity: Health in the balance*. J. P. Koplan, C. T. Liverman, & V. I. Kraak, Eds.). Washington, D.C., National Academies Press.
- Hawley, T. (2000). *Starting smart* (2nd ed.). Retrieved August 1, 2009, from www.zerotothree.org/site/DocServer/startingsmart.pdf?docID=2422&debugMode=false
- Kramer, M. S., Aboud, F., Mironova, E., Vanilovich, I., Platt, R. W., Lutush, L., et al. (2008). Breastfeeding and child cognitive development: New evidence for a large randomized trial. *Archives of General Psychiatry*, 65(5), 378-384.
- Mendoza-Salunga, A. (2007). Nutrition and brain development. *South African Family Practice*, 49(3), 40-42.
- Murphy, J. M. (2007). Breakfast and learning: An updated review. *Current Nutrition & Food Science*, 3, 3-36.
- National Food Service Management Institute. (2009). *Care connection*. University, MS: Author.
- Schuyler Center for Analysis and Advocacy. (2006). Children's nutrition. *Children's Policy Agenda*. Retrieved August 2, 2009, from www.scaany.org/resources/documents/childhealthseries_nutrition.pdf
- Scrimshaw N. S., & San Giovanni, J. P. (1997). Synergism of nutrition, infection, and immunity: An overview. *American Journal of Clinical Nutrition*, 66, 464S-77S.
- Uuay, R., & Dangour, A. D. (2006). Nutrition in brain development and aging: Role of essential fatty acids. *Nutrition Reviews*, 64(5), S24-33.
- U.S. Department of Agriculture, Food Nutrition Service, & National Food Service Management Institute. (2005). *USDA recipes for child care*. Retrieved August 1, 2009, from www.nfsmi.org
- Zimmermann, M. B., Connolly, K., Bozo, M., Bridson, J. Rohner, F., & Grimci, L. (2006). Iodine supplementation improves cognition in iodine-deficient schoolchildren in Albania: A randomized, controlled, double-blind study. *American Journal of Clinical Nutrition*, 83, 108-114.

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This project has been funded at least in part with Federal funds from the U.S. Department of Agriculture, Food and Nutrition Service through a grant agreement with The University of Mississippi. The contents of this publication do not necessarily reflect the views or policies of the U.S. Department of Agriculture, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government. The University of Mississippi is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA Employer.