



Vitamin B-12: Everyday for Healthy Brains and Bodies

Getting Ready

1. Review lesson plan before each session.
2. Review Additional Information for the Educator.
3. Copy overheads:
 - a. Vitamin B-12 Everyday for Healthy Brains and Bodies
 - b. Vitamin B-12 and Your Body
 - c. Eat Vitamin B-12 Everyday
 - d. Food and supplement labels (5 of them)
4. Copy handouts:
 - a. ✓ Check one to get the vitamin B-12 you need each day!
 - b. Post-test: Vitamin B-12 Questions
5. Have evaluation and attendance forms ready.

Supplies

1. Pictures or package labels of meat, poultry, fish, milk, yogurt, cheese, eggs.
2. Cereals: not always fortified with vitamin B-12 (e.g., generic brands; read labels carefully).
3. Cereals: fortified with vitamin B-12 (find brands with 25% to 100% of the Daily Value for vitamin B-12).
4. Nutritional supplements that vary in their vitamin B-12 content such as:
 - a. Multi-vitamin-mineral supplement with about 2 to 6 micrograms (mcg) of vitamin B-12
 - b. Multi-vitamin-mineral supplement for seniors with about 10 to 25 micrograms (mcg) of vitamin B-12
 - c. Vitamin B-12 supplement with 1,000 to 2,000 micrograms (mcg) of vitamin B-12

Beginning the Session

1. Introduce yourself by name and the organization that you represent.
2. Summarize the lesson by going over the objectives.
3. Let the group know that the lesson will be informal and they can ask questions anytime.

Objectives – The participants will:

1. Understand how vitamin B-12 keeps people healthy.
2. Recognize risk factors for vitamin B-12 deficiency.
3. Develop a personal plan to get vitamin B-12 from cereals or supplements every day.



Script

Introduction

(Start with this series of questions.)

- Can anyone tell me about vitamin B-12?
- Are any of you getting vitamin B-12 shots from your doctor?
- It is true that many older adults are deficient in vitamin B-12, and may be getting vitamin B-12 shots from their doctor.

Show handout, Vitamin B-12 Everyday for Healthy Brains and Bodies.

- In fact, vitamin B-12 deficiency is common in older adults -- about one of every 10 older adults has vitamin B-12 deficiency.
- Vitamin B-12 deficiency can cause many health problems.

So today we are going to talk about how vitamin B-12 keeps us healthy, the reasons why people aged 50 and older should eat crystalline vitamin B-12 every day, some breakfast cereals and supplements that contain crystalline vitamin B-12, and how to look for at least 25% of the Daily Value for vitamin B-12 on food and supplement labels. We'll also develop a personal plan to make sure we get vitamin B-12 every day.

Does anyone know how vitamin B-12 helps keep people healthy?

- Vitamin B-12 is very important for your brain, nerves, and blood system. People who are vitamin B-12 deficient can develop numbness, weakness, problems seeing, poor memory, confusion, tingling in the hands and feet, difficulty walking, and anemia (large red cells).

Show handout, Vitamin B-12 and Your Body.

- Vitamin B-12 is needed in the brain and the nervous system that controls functions such as our vision, feeling in the hands, and movement of our arms and legs; and also in the blood.



Can anyone tell me the risk factors for vitamin B-12 deficiency?

Refer to Vitamin B-12 and Your Body.

- The main risk factor for vitamin B-12 deficiency is being age 60 or older, because as we age:
 - Stomach acid decreases so vitamin B-12 can't be digested in the stomach.
 - The absorption of vitamin B-12 decreases in the intestine.
- Other common risk factors for vitamin B-12 deficiency are:
 - Intestinal problems such as ulcers or having part of the intestine removed.
 - Taking medications such as antacids and laxatives on a regular basis.

Protect yourself from vitamin B-12 deficiency by:

- Eating animal foods such as meat, poultry, fish, milk, cheese, and eggs.
- Consuming crystalline vitamin B-12 from fortified cereals or supplements every day.

Can anyone name the main food sources of vitamin B-12?

- Vitamin B-12 is found naturally only in animal foods such as liver, meat, poultry, fish, eggs, milk, cheese and other dairy foods.
- Vitamin B-12 is not found naturally in plant foods such as fruits or vegetables.

Show animal food items such as meat, poultry, fish, eggs, and dairy foods (models, actual foods or containers).

- If you eat animal foods, then you are getting some vitamin B-12 each day.
- Vitamin B-12 is also added to many, but not all, breakfast cereals. This form of vitamin B-12 is called crystalline vitamin B-12. Crystalline vitamin B-12 is found in some fortified cereals.
- Vitamin B-12 is added to some, but not all, fortified foods such as soy milk, breakfast bars, and sports bars.
- Vitamin B-12 is also found in many nutritional supplements such as multi-vitamin-mineral supplements.



As people age, their bodies can't absorb the vitamin B-12 found in animal foods very well.

- So, everyone over 50 years of age should get crystalline vitamin B-12 everyday from a fortified food, such as cereal, or a vitamin supplement.

Show handout, Eat Vitamin B-12 Everyday. Also show the cereal food labels on the overhead and some cereal boxes.

- Here are some brand name breakfast cereals that have crystalline vitamin B-12.
- Generic or store brand breakfast cereals may not have vitamin B-12.
- There is usually no vitamin B-12 in oatmeal or grits.
- If you enjoy eating breakfast cereal, then choose a cereal that has vitamin B-12.
- Choose cereals that have at least 25% of the Daily Value for vitamin B-12 (see food label).
- If you do not eat a breakfast cereal with vitamin B-12, then you should take a supplement with vitamin B-12 every day.

Show the supplement food labels on the overhead and some supplement bottles.

- Here are some supplements that have vitamin B-12.
- Choose supplements that have at least 25% of the Daily Value for vitamin B-12 (see supplement label).

Let's make a personal plan to get vitamin B-12 everyday.

- Let's look at our handout called "✓ Check one to get the vitamin B-12 you need each day!"
- Remember, get vitamin B-12 everyday from a fortified food or a vitamin supplement.

How can I find out if I have vitamin B-12 deficiency?

- Unfortunately, people are usually only tested for vitamin B-12 deficiency if they already have signs of vitamin B-12 deficiency such as severe memory problems or large red cells.
- Usually people with dementia are tested by their doctor for vitamin B-12 deficiency.
- You can ask your doctor to test your blood for vitamin B-12 deficiency.



Vitamin B-12 Deficiency in the Elderly

Additional Information for the Educator

Prevention of vitamin B-12 deficiency

Nutrition and health policy regarding vitamin B-12 deficiency is currently evolving. Between 5 and 15% of older adults have vitamin B-12 deficiency. Studies conducted by Dr. Mary Ann Johnson and her colleagues at the University of Georgia suggest that about 20% of older adults in Older Americans Nutrition Programs have vitamin B-12 deficiency. High rates of vitamin B-12 deficiency in these elders are linked to advanced age, low use of fortified breakfast cereals, low use of supplements containing vitamin B-12, and low intakes of animal foods that contain vitamin B-12 such as meat and dairy foods (Brackett et al., 1999).

There are many good reasons to help older adults prevent vitamin B-12 deficiency. Vitamin B-12 deficiency has serious health consequences such as numbness, weakness, visual problems, poor memory, confusion, tingling in the hands and feet, difficulty walking, and a blood disorder called anemia (large red cells). Some, but not all, studies show that people with Alzheimer's disease have poor vitamin B-12 status. Low serum levels of vitamin B-12 and other B vitamins may cause an increase in homocysteine levels, which is a risk factor for cardiovascular disease.

The National Academy of Sciences, who establishes the Recommended Dietary Allowances, recommends that all adults aged 50 and older consume the majority of their vitamin B-12 in the crystalline form. This form is only found in fortified foods and supplements that have vitamin B-12 added. As people age, stomach acid often decreases, which impairs the digestion and absorption of vitamin B-12 from animal foods. Crystalline vitamin B-12 from fortified cereals and supplemental nutritional formulas protect against B-12 deficiency in older adults (Rajan et al., 2002; Garcia et al., 2002).

Crystalline vitamin B-12 is easier for the body to absorb, because it does not require digestion in the stomach. Vitamin B-12 is tightly bound to the protein in animal foods such as beef, pork, poultry, fish, eggs, and dairy foods. Stomach acid is required to digest and separate the vitamin B-12 from the protein in animal foods. Many older adults have low stomach acid because they have atrophic gastritis (which causes the stomach to decrease acid production) or they regularly take antacids or acid blockers that lower stomach acid. About 30% of older adults have atrophic gastritis, and a large number of older adults also take antacids. There is some evidence that other medications that decrease transit time (laxatives) or damage the intestine (anti-inflammatory agents) may also increase the risk of vitamin B-12 deficiency.

A less common cause of vitamin B-12 deficiency is the loss of intrinsic factor. Intrinsic factor is produced by the stomach where it binds vitamin B-12 and carries it to the intestine for absorption. This type of vitamin B-12 deficiency is called pernicious anemia.



Unlike other B-vitamins, such as folic acid, vitamin B-12 is added to only a few foods. Name brand breakfast cereals usually, but not always, have vitamin B-12 added. Generic or store brand breakfast cereals usually do not contain vitamin B-12. Manufacturers are beginning to add vitamin B-12 to more of their breakfast cereals. Older adults who do not consume a breakfast cereal fortified with vitamin B-12 should take a supplement that contains vitamin B-12. Multi-vitamins formulated for older adults are a good choice for a supplement.

Despite the high prevalence and serious consequences, older adults are not routinely screened for vitamin B-12 deficiency. There are no public health policies, such as there are for high cholesterol or high blood sugar, that recommend routine screening for vitamin B-12 deficiency. Unfortunately, most people are diagnosed with vitamin B-12 deficiency after they develop the symptoms. Therefore, prevention of vitamin B-12 deficiency is vitally important.

Officially, the Recommended Dietary Allowance for vitamin B-12 is 2.4 micrograms (mcg) per day. The Daily Value for vitamin B-12 is 6 mcg/day. However, some studies have shown that 10 mcg or more of vitamin B-12 daily is needed to prevent vitamin B-12 deficiency in older adults. Although currently there are no scientific studies that document the amount of vitamin B-12 that will prevent vitamin B-12 deficiency in the elderly, it may be prudent to consume between 10 and 25 mcg/day (167% to 417% of the Daily Value). These amounts may sound excessive. However, vitamin B-12 is not toxic, there is no Upper Level, and vitamin B-12 can be safely consumed in amounts up to at least 2,000 mcg each day (2 mg).

There is concern about the use of many dietary supplements. However, older adults who do not consume vitamin B-12 from fortified foods such as breakfast cereals should use vitamin B-12 supplements.

It is actually cheaper to consume vitamin B-12 from a supplement than from a fortified cereal. For example, a daily dose of 6 mcg of vitamin B-12 (100% of the Daily Value) from a multi-vitamin-mineral supplement costs about 6 to 12 cents, while a daily serving of breakfast cereal costs about 15 to 33 cents. Also, some multi-vitamin-mineral supplements marketed to older adults contain 25 mcg vitamin B-12 (about four times the Daily Value) and contain other essential nutrients lacking in the diets of many older adults. Breakfast cereals with both vitamin B-12 and fiber may be a more attractive source of vitamin B-12 than a supplement. Because of the many issues involved, your clients may need your assistance in making a personal plan to obtain vitamin B-12 from a cereal or supplement daily.

Diagnosis of vitamin B-12 deficiency

Vitamin B-12 deficiency is suspected in people with certain mental disorders or who have large red cells with anemia (macrocytic anemia). Other causes of macrocytic anemia include folate deficiency, which is now quite rare because of FDA-mandated fortification of the food supply with this B-vitamin.



In the past, vitamin B-12 deficiency was defined as serum vitamin B-12 concentrations less than 100 pg/ml or less than 200 pg/ml. However, it is now known that much higher concentrations of vitamin B-12 are associated with vitamin B-12 deficiency. Also, vitamin B-12 deficiency causes increases in another metabolite called methylmalonic acid. Thus, the most definitive diagnosis of vitamin B-12 deficiency involves measurement of both serum vitamin B-12 and serum methylmalonic acid. Clinical laboratories can test for both of these indicators at a cost of approximately \$150. A combination of serum vitamin B-12 less than 350 pg/ml and serum methylmalonic acid greater than 271 nmol/L confirms vitamin B-12 deficiency (Stabler et al., 1999). Vitamin B-12 deficiency can also cause an increase in serum homocysteine, which is a risk factor for cardiovascular and neurological disorders.

Treatment of vitamin B-12 deficiency

Once diagnosed, vitamin B-12 deficiency is usually treated with injections of vitamin B-12. During the first month, injections of vitamin B-12 are generally given weekly, followed by one injection each month (1,000 mcg or 1 mg/month by injection). Although not routinely used, oral doses of vitamin B-12 are very effective in the treatment of vitamin B-12 deficiency. A daily dose of 1,000 mcg to 2,000 mcg is recommended. These amounts can be found in single supplements of vitamin B-12. Treatment with injections or high dose oral supplements of vitamin B-12 should continue for life. People with vitamin B-12 deficiency should work closely with their physician to be sure that they are receiving adequate treatment for vitamin B-12 deficiency.

Summary

Recommendations concerning vitamin B-12 in older adults is evolving. Ongoing research will provide more definitive recommendations in the future. Current information suggests that:

- Vitamin B-12 deficiency is common in older adults.
- Risk factors include low stomach acid, taking antacids, and low intakes of crystalline vitamin B-12.
- Consuming a crystalline form of vitamin B-12 daily from fortified foods and/or supplements can prevent vitamin B-12 deficiency.
- Between 10 and 25 mcg of vitamin B-12 (167 to 417% of the Daily Value) from fortified foods or supplements will probably be more effective than lower amounts of vitamin B-12 in preventing deficiency.
- Treatment of vitamin B-12 deficiency should continue for life and involves monthly injections of 1,000 mcg or daily oral doses of 1,000 to 2,000 mcg.

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Primary author: Mary Ann Johnson, Ph.D.
NOAHnet@uga.edu

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Vitamin B-12

Everyday for Healthy Brains and Bodies

- Vitamin B-12 deficiency is common in older adults.
- Vitamin B-12 deficiency can cause health problems such as:
 - Numbness, weakness, tingling of the hands or feet.
 - Vision problems.
 - Poor memory, confusion.
 - Blood problem called anemia.
- People 50 and older should eat crystalline vitamin B-12 daily.
- Crystalline vitamin B-12 is the form added to some cereals and supplements, and it is easy for the body to absorb.
- Many cold cereals and supplements contain vitamin B-12.
- Look for at least 25% of the Daily Value on the label.
- Vitamin B-12 is not toxic and up to 2,000 mcg daily is safe.



Vitamin B-12 and Your Body

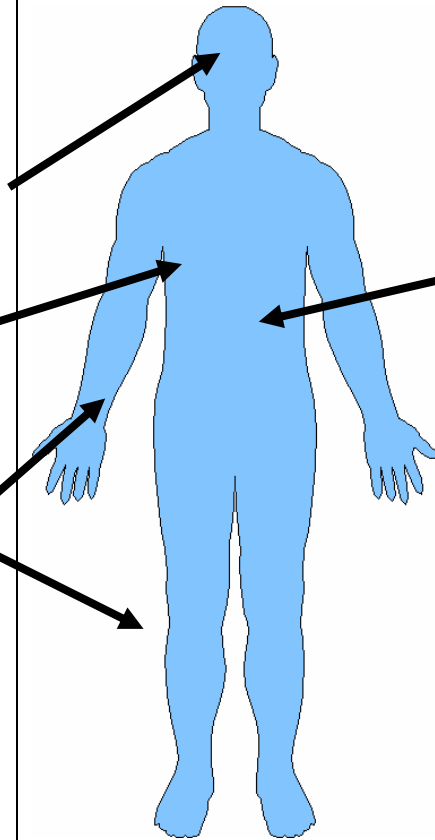
Eat vitamin B-12 from cereal or supplements everyday!

Vitamin B-12 is needed for:

Brain, eyes

Blood

Movement of arms and legs



Aging and medications lower stomach acid which lowers the digestion and absorption of vitamin B-12



**Eat Vitamin B-12 Everyday from:
Cereal**



**or
Supplements**



Read labels carefully!



#1 Kellogg's Complete[®] Wheat Bran Flakes

Nutrition Facts

Serving Size 3 / 4 Cup (29g/1.1 oz)
Servings per Container About 17

Amount Per Serving	Cereal	Cereal with 1/2 Cup Vitamins A & D Fat Free Milk
Calories	90	130
Calories from Fat	5	5
% Daily Value		
Total Fat	1%	1%
Total carbohydrate		
Dietary Fiber 5g	20%	20%
Sugars 5g		
Vitamin B12	100%	110%



#2 **Total[®] Raisin Bran**

Nutrition Facts		
Serving Size	1 Cup (55g)	
Servings per Container	About 9	
Amount Per Serving	Cereal	Cereal with ½ Cup Vitamins A & D Fat Free Milk
Calories	170	210
Calories from Fat	10	10
% Daily Value		
Total Fat 1g	1%	1%
Total carbohydrate		
Dietary Fiber 5g	20%	20%
Sugars 20g		
Vitamin B12	100%	110%



#3 **General Mills Multi-Bran Chex®**

Nutrition Facts

Serving Size **1 Cup (58g/2 oz)**
Servings per Container **About 8**

Amount Per Serving	Cereal	Cereal with ½ Cup Vitamins A & D Fat Free Milk
Calories	200	240
Calories from Fat	15	15
% Daily Value		
Total Fat 1.5g	2%	3%
Cholesterol	0%	0%
Total carbohydrate		
Dietary Fiber 7g	27%	27%
Sugars 12g		
Vitamin B12	25%	35%



#4 Multi-Vitamin-Mineral Supplement
May have 20 to 30 nutrients

Supplement Facts

Serving Size 1 Tablet

Amount Per Tablet		% Daily Value
Vitamin B6	3 mg	150%
Folate	400 mcg	100%
Vitamin B12	9 mcg	150%



#5 Multi-Vitamin-Mineral Supplement for Seniors
May have 20 to 30 nutrients

Supplement Facts

Serving Size 1 Caplet Only

Amount Per Caplet		% Daily Value
Vitamin B6	3 mg	150%
Folate	400 mcg	100%
Vitamin B12	25 mcg	417%



#6 Vitamin B-12 Supplement

Supplement Facts

Serving Size 1 Caplet Only

Amount Per Caplet	% Daily Value
Vitamin B12 1,000 mcg	16,667%

INGREDIENTS: Cyanocobalamin



✓ Check one to get the vitamin B-12 you need each day!

	Daily Value, %	mcg	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Breakfast cereal	25	1.5							
Breakfast cereal	50	3							
Breakfast cereal	100	6							
Supplements:									
• Multi-vitamin-mineral	100	6							
• Multi-vitamin-mineral	167	10							
• Multi-vitamin-mineral	417	25							

Note: If your doctor says you have vitamin B-12 deficiency, then ask if you can take an oral supplement of 1,000 to 2,000 µg(equals 1 to 2 mg) daily. Be sure to follow your doctor's advice.



Name: _____
Date: _____
County: _____

Vitamin B-12 Questions
Circle your answers

- | | | |
|--|----|-----|
| 1. Did you learn anything new today? | No | Yes |
| 2. Are you going to eat vitamin B-12 from cereal or supplements every day? | No | Yes |
| 3. Do you take a multi-vitamin mineral supplement every day? | No | Yes |
| 4. Do you eat milk or cheese every day? | No | Yes |
| 5. Do you eat meat, poultry or fish every day? | No | Yes |
| 6. Do you eat a cold breakfast cereal every day? | No | Yes |
| 7. What cold breakfast cereals do you usually eat? | | |
