ARIZONA COOPERATIVE EXTENSION
THE UNIVERSITY OF ARIZONA • COLLEGE OF AGRICULTURE AND LIFE SCIENCES

Backyards & Beyond

Summer 2011 RURAL LIVING IN ARIZONA Volume 5, Number 2

ARIZONA

Featured Plant

Common Name: Fourwing saltbush
Scientific Name: *Atriplex canescens*

Coronado RC&D, *Shrubs of Southeastern Arizona*

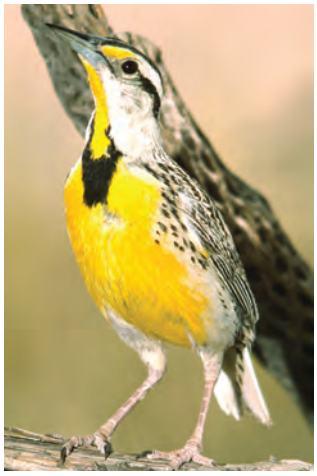
Mature plants are mostly 2 to 4 feet tall, but may be as tall as 8 feet in specific ecotypes. Leaves are alternate, narrow (about 1/8 to ½ inch) and 1 to 2 inches long, grayish in color. The tiny male and female flowers are found on separate plants (dioecious). The female flowers develop into a dry achene fruit that is prominently 4-winged.

This species occurs on many diverse sites throughout most of the western U.S. and northern Mexico at elevations of 2,500 – 8,000 feet. In southeastern Arizona, it may be found on sandy, loamy, and saline bottomlands or loamy and limy uplands. It is highly tolerant of drought, salinity and alkalinity.

The leaves and young stems provide palatable and nutritious browse for livestock, elk, deer and antelope. The fruits provide abundant food for birds, rodents, other wildlife, and livestock. Native Americans used the young shoots as food and a source for a yellow dye. Seeds were ground to use as meal and as a leavening agent for bread.

Featured Bird

Common Name: Eastern Meadowlark (pictured) and Western Meadowlark
Scientific Name: *Sturnella magna* and *Sturnella neglecta*



Dan L. Fischer

Dan L. Fischer – Author of *Early Southwest Ornithologists, 1728-1900*, University of Arizona Press

At first glance the distinction or separation of the two meadowlark species occurring in Arizona presents real and difficult challenges. Perched on the top of a bush, post or on the ground in open country, the subtle plumage differences are ever so slight. When fully exposed in this manner, especially during the breeding season, the males display a beautiful splash of yellow on their breast with a very pronounced black V. Chunky bodied with a short tail and a rather long bill, their head is marked with a black eye line and crown separated by white. Buffs, browns and black on their back present a cryptic pattern making them very difficult to see, especially in dry grass. Their feet, if visible, appear quite large.

To this point the two species may appear as one, especially to the casual observer. Dr. H.C. Oberholser, a student of these species for many years, expressed that in their case of "....similarity of plumage and size...they may breed in the same field and sing from neighboring fence posts, yet their songs are totally different, which is their most obvious indicator." The song of the male Western Meadowlark is very melodic and flute-like with several whistles followed by complex bubbling and gurgling. Their call is a low chuck. The characteristic song of the Eastern Meadowlark is strikingly different with a series of high pitched buzzy, almost rattle like sounds that often include a short series or variations of whistles. When flying or feeding in the grass they are in constant contact through their vocalizations.

The Eastern Meadowlark reaches its western frontier in Arizona and, within the state, it is most common in the southeast with some occurring in central and northern areas. The Western Meadowlark is more widespread in Arizona, but is sparse in the southern portion and almost totally absent in the southeast. In general the Eastern favors the drier conditions while the Western prefers wetter conditions. Because of yearly precipitation variations the two species sometimes overlap or interchange their breeding distribution from previous years. When the two species occasionally interbreed, their hybrids are sterile.

The history and recognition that two species exist is quite interesting in that it involved the efforts of many individuals. Some will hereby be briefly noted. Carolus Linnaeus (1707-1778) first described and applied the Latin species name *magna* to the Eastern Meadowlark in 1758, based on "The Large Lark" from the work and travels in the southeastern coastal region of America by Mark Catesby (1682-1773).

While on his trip up the Missouri River in 1844, John James Audubon (1785-1851), the famous artist-naturalist, stated "....the existence of this species was known to...Lewis and Clark...across the Rocky Mountains to the Pacific [1804-06]; no one has since taken the least notice of it." Continuing, he wrote "....its curious notes were first noticed by Mr. J.G. Bell [expedition taxidermist], without which in all probability it would have be mistaken for our common species...." From that encounter Audubon recognized the distinction and described it as the Western Meadowlark, appropriately applying the Latin species name *neglecta,* meaning "neglected" or perhaps, in this case, overlooked.

An additional note, the race of the Eastern Meadowlark occurring in Arizona is sometimes referred to as Lilian's (*lilianae)* Meadowlark, named for Mrs. Lillian Hanna Baldwin by Dr. Oberholser in 1930. She presented this type to the Cleveland Museum.

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ARIZONA COOPERATIVE EXTENSION
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Sativa Bennett

Food Safety in the Home Gardens

Bruce Peters

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Following many recent outbreaks of microbial pathogens in the nation's food, consumers are more familiar than ever with *E. coli* and *Salmonella.* While the public health surveillance systems are closely focused on the nation's food producers there is little emphasis on food safety in the home garden. Illnesses caused by *E. coli* or *Salmonella* in vegetables, meat or eggs are not solely restricted to products found in supermarkets. Food borne illnesses can also be caused by unsafe growing and handling practices in backyard gardens. No matter if you garden because it's a hobby, or you are trying to cut down on the grocery bill, home gardeners need to become aware of fresh produce safety.

Foodborne Pathogens and Manure

There are a number of foodborne microbial pathogens associated with the contamination of fresh fruits and vegetables. Microbial pathogens such as *E. coli, Salmonella* and others occur most frequently in manure and in fresh manure much more often than in mature, or composted, manure. Root crops and leafy or uncooked vegetables have the greatest risk of being tainted by manure applications to soil. These crops can also become contaminated through direct or indirect contact with pets, and wild or domestic animals. While the bacteria do not appear to make these animals sick, the animals carry and shed the bacteria in their feces. And, although plant derived compost has reduced food safety risk, birds, dog, cats, reptiles, rodents and other animals or insects could add their waste to a home garden compost pile, contaminating otherwise pure vegetable derived compost. The composting operation should not allow cross contamination of finished compost with fresh uncomposted materials.

Drinking and recreational waters have been identified as carriers in several outbreaks, possibly from fecal contamination by infected animals or people. Surface water in close proximity to where animals have defecated should never be used for irrigation, the applications of pesticides or for washing harvested produce. Ground water or well water also can be contaminated in this manner. To minimize exposure to animal waste, livestock, pets and wild animals should not be allowed to freely roam in plant growing areas or in water sources used for gardening.

The Dangers of *E. coli* O157:H7

While fresh produce can be contaminated with several pathogens, *E. coli* O157:H7 is of most concern, as this is the pathogen that has been implicated in most *E. coli* outbreaks. The pathogen can survive drought, refrigeration, freezing, and can even tolerate dry, acidic or salty conditions. Furthermore, it's remarkably infectious, being able to cause serious illness after only minimal exposure. Ingesting very few bacterial cells can result in human infection. Particularly vulnerable to *E. coli* O157:H7 are young children and the elderly. Symptoms of illness have been shown to progress quickly, often with severe consequences in susceptible individuals.

Animal and human feces, manures, and tainted water can all carry pathogens, especially *E. coli* O157:H7. While most bacterial strains are destroyed at composting temperatures that range from 130-140°F, *E. coli* O157:H7 cannot be consistently killed except by composting at temperatures that are above 160°F.

Reducing the Threat of Foodborne Pathogens in Gardens

The microorganism's survival in unfavorable conditions, severe disease potential, and small infectious dose demand significant strategies to minimize the risk of food contamination. Fortunately, the risk of developing a foodborne illness can be minimized. The following center on the reduction of foodborne pathogens, particularly *E. coli* O157:H7, in the garden.

WATER

Water is used to irrigate, transport applied nutrients to plant roots, deliver pesticides and wash harvested fruits and vegetables. When feasible, potable water should be used for these purposes to reduce the risk associated with the spread of microbial pathogens. If this is not possible, minimize the threat of water contamination on consumables by inspecting the area around the water source to:

- Confirm that manure is not stored near garden water supplies.
- Ensure that septic systems are not leaking near the source of irrigation water.
- Make certain that uncomposted manure is not applied to areas near water used for irrigation.
- Validate that livestock, pets and wildlife have restricted access to irrigation water.
- Verify that surrounding neighbors are controlling potentially contaminated runoff into the garden.

It is essential to avoid direct contact of contaminated water with the fruits or vegetables you plan to harvest and consume, and the type of plant affects how water could be applied. Limiting direct contact between potentially contaminated water and the crop is essential. Thus, it is advisable to water with a drip system or a furrow or flood system rather than with sprinklers, if the edible portion of the crop is located above the soil such as in leafy greens, tree fruits and cole crops.

GARDEN SITE

Gardens are generally safe, healthy, and enjoyable environments, but it is important to keep safety in mind when consuming the garden fresh produce. Locate a vegetable garden in an area with the smallest potential for contamination from fresh manure. It should be as far away as possible from manure or composting piles and isolated from animals, including wildlife, pets and livestock. This added measure will lower the risk associated with microorganisms within fecal waste by reducing direct contact of fresh manure with fruits and vegetables. If the garden site is close to manure piles or animal pens, covering those areas could prevent contaminated water from flowing into vegetable growing areas.

MANAGING MANURE

Most animal manures are exceptional organic soil amendments and fertilizers. However, it is not recommended to spread fresh, uncomposted manure to soils where fruits or vegetables are grown. While composting manure properly will kill most pathogens, uncomposted and raw manures can contain, *E. coli* O157:H7 and other environmentally resilient microbes. To properly compost manure, the following conditions should be met:

- Mixing. When a compost pile is adequately mixed, not only is aeration and subsequent breakdown of the material enhanced, but mixing also increases the required temperature to kill even the hardiest microbes.
- Curing. Allowing the composted manure to cure for two to four months before applying it to a garden soil will improve the likelihood for beneficial bacteria to replace disease-causing bacteria.
- Home Composting. Soil enriched with compost promotes healthy plant growth while saving money on fertilizer costs. Commercial composting facilities compost manure at higher and more uniform temperatures, use larger compost volumes and greater temperature monitoring, home composting could be considered riskier than commercial composting operations. However, home composting plant materials alone (without manure) avoids potential pathogen problems. And, composting manure with yard and garden waste has been shown to reduce the risk of contaminating garden vegetables with pathogens. Most importantly, ensure that during composting, piles reach temperatures above of 140°F for several days to reduce the risk of microbial contamination.
- Aged Manure. When using aged (not composted) manure in a garden, the following practices will minimize the potential for contamination:
    - Avoid the application of uncomposted manure to growing food crops.
    - Never leave aged manure on the soil surface where it can have direct contact with the crop. Always incorporate into the soil.
    - Do not apply manure immediately prior to harvest. Delaying harvest at least 120 days from manure application can significantly minimize the risk of food borne contamination. This can be safely reduced to 90 days if the edible portion is protected by a husk, pod or shell.

Gardens can be a pleasurable and relaxing kind of work and is an ever-changing, ever-evolving hobby. It's fun to try new growing methods or new foods. When you practice safe growing habits you can rest assured that the food you produce is fresh and safe.

Happy and safe gardening!

References

Barinas, M., D. Doohan, R. Downer, et al. 2010. Food Safety for Fruitsand Vegetables. http://ohioline.osu.edu/anr-fact/pdf/0025.pdf

Beuchat, L.R. and J. Ryu. 1997. Produce Handling and Processing Practices. Emerging Infectious Diseases. 3:(4)459-465.

Beuchat, L.R. Surface decontamination of fruits and vegetables eaten raw: a review. Available at www.who.int/fsf/new.htm. Accessed March 1, 2000.

Buchanan, L.B. and M.P. Doyle. 1997. Food-borne disease significance of Escherichia coli O157:H7 and other enterohemorrhagic *E. coli.* Food Tech. 51(10)69-76.

Harris, L.J., T. Suslow. 2007. Food safety tips for your edible home garden. http://ucfoodsafety.ucdavis.edu/files/26392.pdf

Hillers, V. 1999. Guidelines for using manure on vegetable gardens. Washington State University Food Safety Advisor 2-24 to 2-25.

Hussein, H.S. 2000. On-farm factors can decrease risk of *E. coli* contamination. Feedstuffs, March 13, 2000; pp. 18-23.

Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln. 1999. Preliminary study: vinegar washing reduces risk of *E. coli* O157:H7 in lettuce.

Wright, J.R., S.S. Sumner, C.R. Hackney, et al. 2000. Reduction of *Escherichia coli* O157:H7 on apples using wash and chemical sanitizer treatments. Dairy, Food & Environmental Sanitation 20:120-126.

Always Remember...

- *E. coli* O157:H7 is especially of concern because of its link to human illness and resilience in the environment.
- When feasible, always irrigate growing areas with potable water.
- Apply only correctly composted manure to growing food crops.
- Compost manure properly to destroy *E. coli* and *Salmonella* before using in the garden.
- Before working with food, always wash hands thoroughly.
- Always wash fruits and vegetables before eating them.

Stephanie Shank

Jerusalem Crickets

Stephanie Shank, Former Extension Agent, 4-H Youth Development,
University of Arizona Cooperative Extension, Yavapai County

Coming home from lunch one day, I was greeted by my next door neighbor. She was obviously distraught and said excitedly, "Help! I am scared to death of spiders and there is the biggest ugliest spider in my bedroom!" I went into my kitchen and emerged with a large empty mayonnaise jar in one hand and a flyswatter in the other. I fully intended to capture the spider, but took the flyswatter at the ready in case a quick dispatch was in order. My neighbor followed me into her house, quaking and wide eyed. She pointed towards the bedroom and in a quavery voice said, "It is in there, on the floor on the far side of the bed!" and refused to enter the bedroom where the offending creature was said to be. Tentatively, I went into the bedroom ready to capture whatever large spider was causing the distress. Halfway expecting to see a large wolf spider that might possibly dash for cover once it sensed my presence, to my surprise and pleasure I discovered that it was not a spider but a Jerusalem cricket! I set the jar down, put the flyswatter in my back pocket and carefully and gently picked up the Jerusalem cricket, which immediately "played dead" when placed in the palm of my hand. My neighbor was relieved that the Jerusalem cricket was not a spider, and she was just as relieved when I took it away.

Jerusalem crickets are some of the most unusual insects found in North America, strictly western in distribution, a few may be encountered just east of the Rocky Mountains. Members of the order Orthoptera, they are related to grasshoppers and crickets. Jerusalem crickets feed on underground tubers, prey on other insects, eat dead animal matter and are not considered to be agricultural pests. They are slow moving, mostly solitary and nocturnal in habit. Active at night, they stay in underground burrows during the day. Generally, they are encountered by finding them crawling in paths or roads at night or in the early morning, or by upturning a rock, stone, or log during the day. They may get into a house by accident, looking for a new place to dig a burrow. My neighbor had recently had an evening get together that lasted long into the night. The nights were pleasant and no mosquitos were out, so the front door had been left open as people moved in and out of the house. It is likely that the hapless Jerusalem cricket made its way into my neighbor's house, simply looking for food and a good place to bed down. Wandering slowly and innocently through the house, it may have by coincidence found its way into the bedroom.

Jerusalem crickets are not rare. There are estimated to be more than twenty species of Jerusalem crickets, but because of their solitary nature and the fact that they are active at night, most people do not regularly encounter them. Their unusual appearance is likely to startle someone who has never seen one before. They have a large almost humanoid head and thorax and a fleshy bulbous black or charcoal gray and creamy white striped abdomen. They have stout, legs which sport some dull spines that assist them to dig and burrow into the ground and also have been observed to be used when making noise. Jerusalem crickets do not make a chirping sound like other crickets do. However, when disturbed they may rub their hind legs along the side of their abdomen producing a hissing noise or described as the sound of "rubbing together pieces of sandpaper" (Insects of Western North America, 1953, E.O. Essig, The McMillan company, New York, New York). Each Jerusalem cricket species has a unique mating call which is produced by drumming the ground with their abdomen. Distinguishing between the different species is done by detecting differences in their mating calls. The unusual appearance of a large, almost human-like head with tiny eyes has caused them to be an object of fear and superstition. In some areas they are known as "niña de la tierra" or "child of the earth".

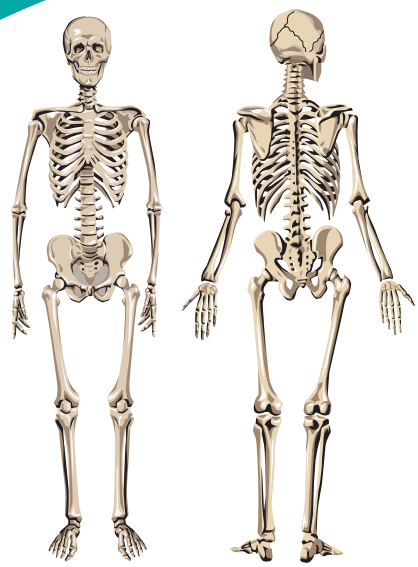
Jerusalem Crickets are one of the largest crickets in North America. A fully grown adult Jerusalem Cricket may be 1 ½ to 2 inches in length. Beneath the head are very strong jaws that the Jerusalem Cricket utilizes for chewing. Even though they are related to grasshoppers, crickets and katydids, the Jerusalem cricket is not a fast runner, nor is it a jumping insect. It never develops wings, so it cannot fly. It differs from grasshoppers, crickets and others by being a solitary insect with a lower rate of reproduction. This means that you won't see hordes of them like you might see with crickets or grasshoppers. Rather docile in its habits, if captured by hand, the Jerusalem cricket is likely to "play dead", until it feels safe to crawl away. If it is handled carelessly it will readily bite, giving a painful pinch.

Jerusalem crickets are not garden pests nor do they attack humans. They are simply doing what they do best… helping the environment by eating dead animal matter, preying on other insects and eating some tuberous plant matter. If you encounter one this summer … either at night crawling around on the ground, or during the day, under a rock or piece of wood, don't panic. Just let it go about its business. And know that you have encountered a seldom noticed child of the Earth, or Jerusalem cricket.

Assistance may be obtained from your local Arizona County Cooperative Extension System Office regarding identification of insect specimens found in your home, garden or yard. Further information can be found in various reference books such as insect field guides like *A Field Guide to Insects: America north of Mexico*, 1990, by Donald J. Borror and Richard E. White. Houghton Mifflin Company, New York, New York, (Peterson Field Guide Series), as well as *Bagging Big Bugs: How to Identify, Collect and Display the Largest and Most Colorful Insects of the Rocky Mountain Region*, 1995, by Whitney Cranshaw and Boris Kondratieff, Department of Entomology, Colorado State University. Fulcrum Publishing, Golden, Colorado. These publications can be found in local bookstores or purchased on line. An online reference can be found at Colorado Insects of Interest: Jerusalem Crickets, <wiki.bugwood.org>.

Eating for Bone Health

Lynne Durrant, Former Extension Agent, Family & Consumer Sciences, Mohave County Cooperative Extension; Vanessa Farrell, Associate in Extension, Nutritional Sciences and Linda Houtkooper, Associate Director for Extension Programs and Extension Specialist, Nutritional Sciences, University of Arizona



Osteoporosis

Osteoporosis is a silent disease that weakens bones, making them fragile and more likely to fracture or break. Bone fractures occur mainly in the spine, hip, and wrist. Osteoporosis risk factors that cannot be changed are:

- Being female
- Postmenopausal
- Having a small skeleton
- Being Caucasian/Asian
- Family history of osteoporosis and fractures
- Advanced age

Osteoporosis risk factors that can be changed:

- Medications with negative affects on bone
- Inadequate or excessive intake of nutrients
- Sedentary – no weight bearing activity
- Excessive exercise
- Low body weight
- Cigarette smoking
- High level of alcohol consumption

It is never too late to make positive changes to your lifestyle and eating habits to help prevent osteoporosis. One of the easiest ways to reduce your risk of osteoporosis, is to consume adequate amounts of vitamin D and calcium in your daily diet.

Vitamin D

Adequate vitamin D helps increase the absorption of calcium. Vitamin D is made in the skin after exposure to sunlight. It only requires 10 - 15 minutes of sun exposure three times a week on the face, hands and arms to meet vitamin D needs. Sunscreens will decrease the formation of vitamin D in the skin. If you regularly use sunscreens, you will need to get vitamin D from your diet or take a supplement. Good dietary sources of vitamin D are fortified foods, fortified milk, egg yolks, liver, sardines and salmon. If a vitamin D supplement is necessary, follow these guidelines:

Recommended Vitamin D Intakes

Age	International Units (IU)/Day
1 - 70 years of age	600
>70 years of age	800
Pregnancy and Lactation 14 - 50 years of age	600

Source: Institute of Medicine, National Academy of Science, 2011.

The current recommendation of the amount of vitamin D an individual should not consume more than is 4000 IU a day. It is difficult to get too much vitamin D unless a person is taking a prescription dose of the vitamin. Very high amounts of vitamin D can be harmful and may result in kidney stones and other kidney problems.

Recommended Calcium Intakes

Age	Milligram (mg) per day	Tolerable Upper Intake Level (UL) mg/day
Infants 0-6 months	200	1,000
Infants 6-12 months	260	1,500
Children 1-3 years old	700	2,500
Children 4-8 years old	1,000	2,500
Adolescent 9-18 years old	1,300	3,000
Adult Males and Females 19-50 years old	1,000	2,500
Adult Males 51-70 years old	1,000	2,000
Adult Females 51-70 years old	1,200	2,000
Adults >70 years old	1,200	2,000
Pregnancy and Lactation		
14-18 years old	1,300	3,000
19-50 years old	1,000	2,500

Source: Institute of Medicine, National Academy of Science, 2011.

Calcium

Adequate calcium intake throughout life is important to maximize calcium storage in the bones during the growing years and to minimize bone loss in later years. It is recommended that an individual does not consume more than the tolerable upper intake level of calcium per day.

Too much calcium may not be a good thing. Consuming too much calcium may lead to dizziness, kidney problems, constipation, fatigue, and poor absorption of iron, zinc and other nutrients.

If you cannot get enough calcium from what you eat and drink, supplements are a safe alternative. When taking a calcium supplement, remember, the body can only absorb about 500 mg of calcium at one time. This amount of calcium should be taken 4 to 6 hours apart.

Start with Foods

Increasing your daily calcium intake is best accomplished by eating foods that are good sources of calcium (provide at least 100 mg of calcium per standard serving size). Try to get 3 to 4 servings of calcium rich foods a day. By eating a variety of foods from the MyPyramid.gov food groups, you can meet your daily calcium requirements. Some examples of high calcium foods from each of the MyPyramid.gov food groups are:

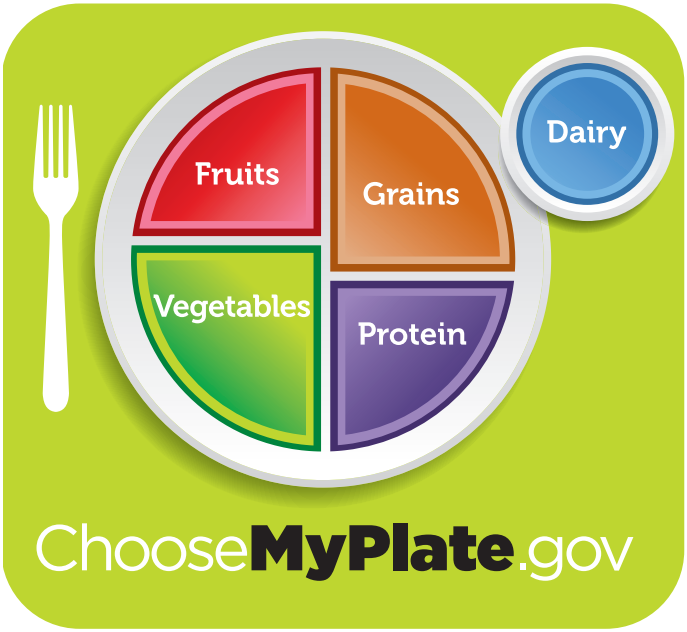
GRAIN GROUP:
spoonbread, English muffin, calcium fortified cereal, and waffles.

VEGETABLES GROUP:
broccoli, kale, and beet greens

FRUITS GROUP:
figs, and calcium fortified fruit juices

MILK GROUP:
milk and milk products

MEAT AND BEANS GROUP:
tofu products fortified with calcium, sardines and canned salmon with bones, and almonds



EXAMPLES OF HOW TO MEET YOUR DAILY CALCIUM NEEDS FROM FOOD

Example 1	Calories	Calcium (mg)
Orange juice, fortified, 1 cup	110	500
Fat-free milk, 1 cup	80	300
Cream of tomato soup, 1 cup	100	150
Cottage cheese, 1%, 1/3 cup	50	40
Waffles, 8 grain, 2 each	180	100
Pudding, chocolate, ½ cup	150	150
TOTAL	670	1240

Example 2		
Salmon w/bones, 3 oz*	130	200
Beans, navy, 1 cup	250	150
American Cheese, light, 1 oz	50	200
Cornbread, 2"X2" square	170	150
Potato, sweet, 1 medium	100	40
Greens, Turnip, 2/3 cup	20	150
Orange, 1 large	90	80
Almonds, dry roasted, 2 oz	340	150
Ice cream, chocolate, ½cup	150	80
TOTAL	1300	1200

Example 3		
Soymilk, calcium fortified, 1 cup	130	200
Cereal, Total ™, 3/4 cup	100	1000
Spaghetti, calcium fortified, 2/3 cup*	210	300
Broccoli, ½ cup	10	20
TOTAL	450	1520

Example 4		
Fat-free milk, 3 cups	250	900
Yogurt, plain, fat-free, 1 cup	100	300
TOTAL	350	1200

Reference: The Food Processor® Version 10.2 and manufacture's labels. Some inconsistencies may occur because all figures have been rounded.

How to Find the Calcium Content of a Labeled Food

The calcium content of a food can be found using the Nutrition Facts Panel of the food label. On the Vanilla Lowfat Yogurt food label, locate calcium on the Nutrition Fact Panel (the highlighted portion). This is the Percent Daily Value of calcium for an 8 ounce serving of Vanilla Lowfat Yogurt.

To find the mg of calcium in a standard serving of a food, drop the % sign from the Percent Daily Value and add a zero. For example: 40% Daily Value = 400 mg. This is the amount of calcium in an 8 oz serving of Vanilla Low fat Yogurt. *Note: this only works for finding the mg of calcium in a serving.*

Nutrition Facts Panel

Vanilla Lowfat Yogurt

Nutrition Facts			
Serving Size 8 oz (277g)			
Serving Per Container			
Amount Per Serving			
Calories 250			Calories from Fat 30
			% Daily Value*
Total Fat 3g			2%
Saturated Fat 2g			10%
Cholesterol 15mg			5%
Sodium 160mg			7%
Total Carbohydrate 36g			12%
Dietary Fiber 0g			0%
Sugar 34g			
Protein 10g			
Vitamin A 2%	•		Vitamin C 4%
Calcium 40%	•		Iron 0%
*Porcentage Daily Values are based on a 2,000 calorie diet.			
Your daily values may be higher or lower depending on your calorie needs:			
	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400 mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat 9	• Carbohydrate 4	•	Protein 4

Top 10 tips for Increasing Calcium in Your Diet

- Purchase and eat foods labeled “high,” “rich in,” “excellent source,” or “good source” of calcium.
- Eat or drink 3 servings of reduced-fat milk products daily.
- Use reduced-fat cheeses as toppings and snacks.
- Add reduced-fat milk to your coffee or tea.
- Substitute reduced fat yogurt or milk for water in pancakes.
- Use reduced-fat yogurt in place of mayonnaise in salad dressings and dips.
- Fortify your foods with calcium by adding nonfat powdered milk to a variety of foods such as meat loaf, sauces, gravies, soups, stuffings, casseroles, blended beverages, puddings, breads, cookies, brownies, mashed potatoes, milk, cooked cereal, and scrambled eggs.
- Eat more vegetables that are good sources of calcium such as beet, mustard, and turnip greens.
- Use calcium fortifed tofu in meatloaf, lasagna and desserts to replace part or all of the meat or cheese.
- Buy products fortified with calcium.

The inserts provide recipes for foods that can help you get the calcium you need.

Additional Resources on Nutrition and Bone Health

Organizations & Websites

National Osteoporosis Foundation
http://www.nof.org
1232 22nd St.,
N.W. Washington, DC 20037
or 1-202-223-2226

National Dairy Council
www.nationaldairycouncil.org/NationalDairyCouncil
3030 Airport Road
LaCrosse, WI 54603
1-800-426-8271

Dairy Council of Arizona
PO Box 26877
Tempe, AZ 85285
480-966-7211

Arizona Osteoporosis Coalition
www.fitbones.org
PO Box 6776
Chandler, AZ 85246
602-749-1008

Bone Builders
www.bonebuilders.org
The University of Arizona
Maricopa County Cooperative Extension
4341 East Broadway Road
Phoenix, AZ 85040
602-470-8086 Ext. 316

National Institutes of Health - Osteoporosis & Related Bone Diseases National Resource Center
http://www.niams.nih.gov/Health_Info/Bone/
1-800-624-BONE

Nutrition, Exercise & Wellness
http://ag.arizona.edu/nsc/ne
www.whymilk.com - calcium information and recipes
University of Arizona, College of Agriculture & Life Sciences, Cooperative Extension, Department of Nutritional Sciences

Publications

Misner S, Farrell *V. Osteoporosis*. Tucson, AZ: University of Arizona Cooperative Extension; 2011. Posted on the College of Agriculture & Life Sciences, Cooperative Extension Website and available for download at: http://ag.arizonaedu/pubs/health/az9712.pdf

Houtkooper L, Farrell V. *Calcium Supplement Guidelines*. Tucson, AZ: University of Arizona Cooperative Extension; 2011. Posted on the College of Agriculture & Life Sciences, Cooperative Extension Website and available for download at: http://ag.arizona.edu/pubs/ health/az1042.pdf

Lohman T., Going S., Houtkooper L., Melcalfe L., Antoniotti-Guido T., Stanford V. T*he Best Book Exercise Program for Osteoporosis Prevention*, Second Edition. DSWFitness: Tucson, AZ: 2008. http://cals.arizona.edu/cpan

Farrell V, Houtkooper L. *Calcium and Calorie Content of Selected Foods.* Tucson, AZ: University of Arizona Cooperative Extension; 2011. Posted on the College of Agriculture & Life Sciences, Cooperative Extension Website and available for download at: http://a.arizona.edu/pubs/health/az1128.pdf

cals.arizona.edu/pubs/health/az1250.pdf

RECIPES

COTTAGE MUFFINS

2 cups all-purpose flour
1 cup yellow cornmeal
4 teaspoons baking powder
1/4 teaspoon salt
3 Tablespoons sugar
2 eggs
1 cup 1% buttermilk
1 cup low fat cottage cheese
1/3 cup salad oil

Pre-heat oven to 400oF. In a large bowl, combine flour, cornmeal, baking powder, salt, and sugar; mix well. In blender or food processor, place eggs, buttermilk, cottage cheese and salad oil. Blend until smooth. Make a well in center of flour mixture and add liquid ingredients all at once. Stir with a fork just enough to blend ingredients. Spoon into two well-greased muffin pans, filling two-thirds full. Bake until golden brown (about 20 minutes). Yield 24 muffins.

Nutrition Information per Serving:

Calories	220
Carbohydrates	32 gm
Fat	7 gm
Protein	7 gm
Sodium	340 mg
Fiber	1 gm
Calcium	100 mg

STRAWBERRY SMOOTHIE

1½ cups strawberries
8 oz vanilla low fat yogurt
3/4 cup skim milk
1 Tablespoon brown sugar
1/8 teaspoon cinnamon

In a blender container combine yogurt, strawberries, milk, brown sugar, and cinnamon. Cover and blend till smooth. If desired, garnish each glass with a whole strawberry. Makes 4 (6-ounce) servings.

Nutrition Information per Serving:

Calories	110
Carbohydrates	21 gm
Fat	1.5 gm
Protein	4 gm
Sodium	55 mg
Fiber	1 gm
Calcium	150 mg

TURKEY ENCHILADAS

2 cups cooked turkey, shredded
2 101/2 oz cans of 98% fat free condensed cream of mushroom soup
16 ounces fat free sour cream
4 ounces diced green chili
1 cup diced onion
1 cup nonfat milk
16 corn tortillas
2 cups low fat cheese, shredded

Preheat oven to 350o F. Lightly coat a 13-by 9-inch baking dish with vegetable cooking spray. In a large bowl combine turkey, soup, sour cream, chilies, onion and milk. Heat each tortilla in microwave for a few seconds just to soften. Spoon about 3 tablespoons of turkey filling onto softened tortilla. Top with about 1 tablespoon shredded cheese. Roll. Place seam-side down in the baking dish. Fill remaining tortillas. Spoon any leftover filling over the top of enchiladas. Sprinkle with cheese. Bake uncovered 35 to 45 minutes or until bubbly and cheese is melted. Yield: 8 servings.

Nutrition Information per Serving:

Calories	340
Carbohydrates	43 gm
Fat	7 gm
Protein	26 gm
Sodium	800 mg
Fiber	4 gm
Calcium	350 mg

Nutrient information calculated using, The Food Processor® Version 10.2.
Some inconsistencies may occur because all figures have been rounded.

A Guide to Healthy Snack Ideas

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Tips on including Kids in Snack Creation

- Have kids help think of new creative snacks including their favorite foods.
- Include kids in the grocery shopping by letting them pick out a new fruit or vegetable to try each week.
- Explore the Arizona Nutrition Network site as a family and include everyone in picking out new recipes to try and make together.

Additional Resources

http://mypyramid.gov/
http://eatwellbewell.org/

Sources

Satter E. How to get your kid to eat but not too much. Boulder (CO): Bull Publishing; 1987.

Recipe courtesy of the Arizona Nutrition Network http://eatwellbewell.org/parents/resources/recipes

Eatright.org

Pictures used with permission of freedigitalphotos.net http://www.freedigitalphotos.net/images/gallery_Fruit_m104-sb_title-so_ascending-page4.html

Carrot Dip (Makes six servings)

Ingredients

- 6 carrots, shredded
- 1 ½ cups fat free plain yogurt
- 1 clove of garlic mashed
- 1 tablespoon oil
- Juice from half a lemon
- ½ tsp salt

Directions

1. Wash hands thoroughly with warm water and soap
2. Wash, peel, and grate carrots
3. Add garlic, oil, lemon juice, and salt to yogurt and stir
4. Add Carrots and mix well
5. Serve as a dip with whole grain crackers or veggies

For nutrient information and more delicious & easy snack recipes, including honey nut yogurt, awesome applesauce, artichoke guacamole and more, visit:

http://eatwellbewell.org/parents/resources/recipes

Food For Thought

Children can develop healthy nutrition habits, by choosing healthier snacks, taking part in snack and meal preparation, and packing healthy snacks for school snack time. Healthy snacks add to a balanced diet and help children stay focused at school.

"The equation for a nutritious snack = (a fruit or vegetable or grain) + (meat/bean or dairy)."

MyPyramid.gov Ideas

Fruit or Veggie Ideas: apple slices, kiwi, oranges, grapes, banana, dried fruit, raisins, celery sticks, carrot sticks, raw broccoli, bell pepper, tomato, tomato pizza sauce

Grain Ideas: whole grain crackers, rice cakes, popcorn, slice of toast, pretzels, whole grain or baked chips, cereal, bagel, pita bread, English muffin

Meat/Bean Ideas: peanuts*, slice of deli meat, peanut butter*, tuna, mixed nuts*, sunflower seeds

Dairy Ideas: string cheese, skim or 1% milk, low fat cream cheese, low fat pudding, low fat yogurt, skim shredded cheese

Eating a combination of foods will help children stay full and focused longer. Creating new combinations adds variety and makes snacks part of a balanced diet.

Be Creative and let your kids come up with combinations of their own favorite healthy foods.

Healthy Snack Ideas

Pack & Go Snacks:

- Celery sticks with peanut butter* for dipping
- Apple slices sprinkled with cinnamon
- Carrots and celery to dip in low fat ranch dressing
- Baked tortilla chips with a container of salsa for dipping
- Bag of pretzels with peanut butter* for dipping
- Whole grain crackers with string cheese
- Apple Cinnamon mini rice cakes with peanut butter* for dipping
- Whole grain pita with sliced banana, spoonful of peanut butter*, and a little honey
- Low fat pudding with animal crackers for dipping
- Fresh fruit such as oranges, grapes, or bananas

Food Safety Tip: Use insulated lunch bags to keep perishable foods cold.

cals.arizona.edu/pubs/health/az1512.pdf

After School Snacks:

- Whole grain pita with a spoonful of pizza sauce, shredded part-skim mozzarella, ring of pineapple, and slice of deli ham
- Spread banana with peanut butter* and roll in whole grain cereal
- Flour tortilla topped with melted cheese, bell pepper, and tomato
- Chocolate rice cake with low fat cream cheese and fresh fruit on top
- Open faced sandwiches on half an English muffin with mustard, slice of cheese, and a slice of deli meat
- Spread a little low fat cream cheese on whole grain crackers
- Bowl of popcorn with parmesan cheese sprinkled on the top

* These snack ideas contain peanuts or products made with peanuts, be cautious when preparing or serving these snacks around children who may have a peanut allergy.

Powdery Mildew

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Figure 1. Powdery mildew of rose.

Figure 2. Powdery mildew of cantaloupe.

Pathogen

Species of fungi in many different genera including *Erysiphe, Sphaerotheca, Uncinula, Microsphaera, Phyllactinia, Podosphaera, Leveillula*, all known as powdery mildews.

Hosts

Some hosts include: vegetables, landscape plants, fruit trees, grapes, desert annuals, trees, and shrubs.

Symptoms/signs

Most powdery mildews are recognized by the white to gray, powdery spots or large blotches on the surface of leaves, stems and fruits of host plants. The white powdery growth consists of the fungal mycelium and asexual reproductive spores. One of the most common powdery mildews in Arizona landscapes is *Podosphaera pannosa,* the powdery mildew of rose (Fig 1). In vegetable gardens, the powdery mildew of cucurbits, *Podosphaera fuliginea,* is problematic all summer (Fig 2).

Environmental conditions

Unlike many pathogens, powdery mildew fungi grow and infect their hosts in the absence of free water. The disease is favored by moderate or high humidity and low light intensity, conditions which are often prevalent on lower plant parts or in dense foliage. Powdery mildew is found throughout the low desert areas most of the year and is one of the few foliar diseases that is prevalent in low desert areas. At higher elevations, powdery mildew fungi appear when their host plants begin to grow new foliage in the spring and may continue to grow and infect plants until late fall.

Disease

The different genera or groups of powdery mildew fungi are very specialized and infect only certain groups of plants. For example, the powdery mildew on watermelon (*Podosphaera fuliginea*) will not infect roses, but infects cantaloupe, squashes and other cucurbits. Likewise, the powdery mildew on grape (*Uncinula necator*) only infects grapes. The spores produced on the leaf surface are easily carried in the wind to new hosts. Unlike most fungi, spores germinate on the surface of plant parts without the presence of free water. In all powdery mildews except the *Leveillula* group, the fungus develops into a mass of tiny tubular filaments called mycelium that grows over the surface. In the *Leveillula* group, the mycelium may be inside the plant tissue as well as on the surface in older infections. Infected leaves may curl, turn brown and die when heavily infected. In fruit trees, grape, and berries, new shoots may be infected and killed.

Powdery mildew fungi survive in low deserts as short-lived windborne spores and as mycelium in the host plant tissue. The mycelium cannot survive unless it is in living host tissue. In colder areas where freezing

At a Glance

- Powdery mildew appears as white, powdery spots on the leaf surface of many different kinds of plants.
- Powdery mildews are specific to their hosts and one type will infect only certain plants, usually those in the same or closely related plant families.
- Disease is favored by warm temperatures, moderate to high humidity, absence of overhead watering, low light intensity and poor air flow.
- Resistance is available in some plant species; sulfur compounds give good control but should be used carefully to avoid foliar burn; potassium bicarbonate is an effective contact treatment.

temperatures are common throughout the winter months, powdery mildew fungi survive as mycelium in the host tissue and by forming a sexual stage with spores that are resistant to drying and cold temperatures. The sexual spores germinate in the spring to start the disease cycle over again.

Prevention/control

Tolerant varieties

When planting trees and shrubs, look for varieties of plants that are suited to the area and avoid those that are most susceptible to powdery mildew. In some plant groups such as cucurbits and for some ornamentals such as crape myrtle, varieties tolerant to powdery mildew are available. Rose varieties vary greatly in their susceptibility. Check seed packets and container tags for information.

Cultural Practices

With good general cultural practices and using plants in the landscape that are not highly susceptible, powdery mildew is not a problem in most cases. The following practices reduce incidence in all but the most susceptible plants.

plant in full sun	plant susceptible plants in sunny locations—examples: zinnias, euonymous, roses , grapes, penstemon
use overhead irrigation	consistent application of free water will inhibit spore germination or kill spores
create good air flow in the canopy	careful pruning in grapes, fruit trees and susceptible shrubs will open the canopy, increasing light and decreasing humidity

Chemical

Timely applications of fungicides can prevent or control powdery mildew. Chemicals may be necessary for very susceptible plants such as grapes and cucurbits. Sulfur is very effective for preventing infection. However, caution must be taken with sulfur applications since some plant species, especially some varieties of cucurbits, are easily damaged by sulfur if applied at high temperatures. Other contact and systemic fungicides are available, and their application rates will vary according to plant type and severity of disease. The table below lists some commonly used compounds for horticultural applications that are available to homeowners.

Compound	Comments
wettable sulfur and dusting sulfur	Label rate; use with caution above 90°F; do NOT use sulfur with oil sprays
bicarbonate of soda	1 tbsp/gal water; effective contact but can burn leaves; use at first detection and repeat applications often
potassium bicarbonate	Label rate; effective contact, no residual activity
Myclobutanil	Label rate; very effective protectant with good residual
Thiophanate methyl	Label rate; mix or rotate with other compounds; good overall control
horticultural oil	Useful as an eradicant, especially for treating woody stems; do not apply oil sprays on plants treated with sulfur sprays, when the temperature is over 90°F or to water stressed plants.

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