



World Vegetable Center



Vegetables and Nutrition for Schools in Burkina Faso

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“Vegetables and Nutrition for Schools in Burkina Faso” is a product of the Project “Vegetables Go to School” (2013-2016). We are grateful for the financial support of the Swiss Agency for Development and Cooperation.

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Publication Number: 17-811

Suggested citation:

Luoh JW, Yang RY, Sobgui C, Mecozzi M, Ouedraogo MS, Thiombiano A, Kouamé SR. 2017. Vegetables and Nutrition for Schools in Burkina Faso. World Vegetable Center, Taiwan. Publication No. 17-811. 57 p.

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INTRODUCTION TO GOOD NUTRITION



Good nutrition means eating healthy foods and a balanced diet to provide the energy and nutrients we need for proper growth and to stay healthy for work, study, and fun. Without good nutrition, people easily become sick and suffer from diseases, infections, and poor energy. Healthy foods help the family fight common diseases and save money on hospital visits.

Good nutrition comes from eating plenty of different types of foods every day.

NUTRITION IN BURKINA FASO

Malnutrition

Nutrition is important for Burkinabés. When people make poor diet and food choices, problems of malnutrition can happen.

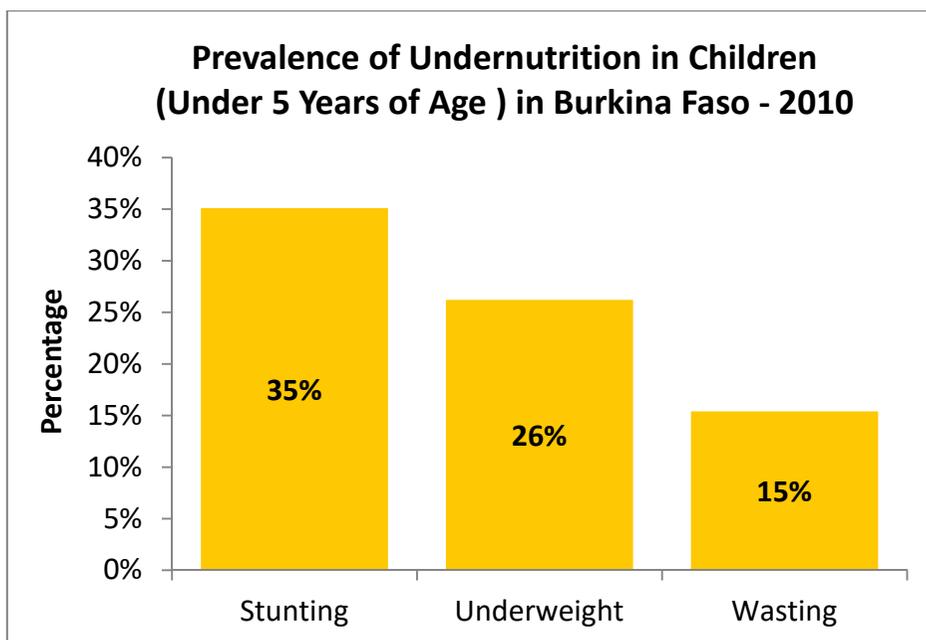
In Burkina Faso, many children face undernutrition conditions every day. In the picture below, we can see that about 1 out of 3 children under the age of 5 are stunted, 1 out of 5 are underweight and about 1 out 9 are wasted for their age.

Malnutrition can be one of two kinds:

- **Undernutrition:** Not eating enough healthy and nutritious foods
- **Overweight and obesity:** Having an imbalanced diet and eating more than enough foods for the body's use

Undernutrition can cause stunting, underweight and wasting in children:

- **Stunting** is when the child's height is shorter than an average child his or her age due to malnutrition
- **Underweight** is when the child's weight is less than an average child his or her age due to malnutrition
- **Wasting** is when the child's fat and muscles are wasting away, making them thin due to being hungry or starving recently



Source: NLiS, 2014

Nutrient Deficiencies

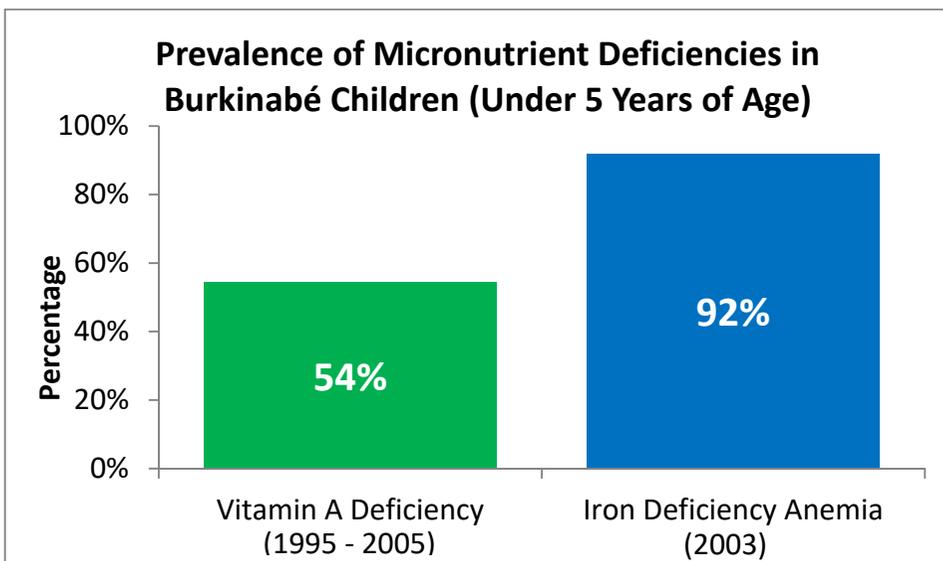
Malnutrition can lead to many nutrient deficiencies. The nutrients we receive from different foods help our bodies maintain normal functions. When one or more of the nutrients are lacking, our bodies become weak and do not function properly.

This table outlines the nutrients in foods and signs of nutrient deficiencies:

Nutrient	Function	Signs of Deficiency
Protein	Used to build new cells, repair wounds, and for energy	Stunted growth, lack of energy, often sick
Water	Needed for body processes and cooling; especially important with excessive sweating, diarrhea, and fever	Dehydration; small amount and dark urine
Vitamin A	Prevents infection; essential for eye health; important for growing children; support immune system	Night blindness and other eye problems; weak immune system
B Vitamins	Help body use nutrients	Weakness, tiredness
Vitamin C	Needed for healthy bones and blood vessels; protects immune system	Swollen, bleeding gums
Folate	Helps red blood cells carry oxygen to the body; may help prevent anemia	Anemia – fatigue, reduced productivity, slower learning
Calcium	Strong teeth and bones; very important for growing children	Thin bones, muscle spasms
Iron	Needed for red blood cells to carry oxygen; especially important for girls and women ages 10-55	Fatigue, reduced productivity, slower learning
Magnesium	Needed for strong bones and teeth; protects immune system	Muscle spasm, tiredness, loss of appetite
Potassium	Needed to rehydrate the body; important with excessive sweating and diarrhea	Dehydration

Nutrient	Function	Signs of Deficiency
Zinc	Important for proper growth for children	Stunted growth
Fiber	Improves digestion and nutrient absorption; food has more bulk, gives feeling of fullness	Hard stools, constipation

Vitamin A and iron are nutrients that are most often deficient in children and adults, especially pregnant and young mothers. In Burkina Faso, about half of the children under 5 years old lack vitamin A in their diet, leading to long-term eye problems such as night blindness, xerophthalmia (extremely dry eyes), and eventually going blind. More than 90 percent (9 out of 10 children) of children under 5 years old are iron-deficient. This is a serious nutritional problem in the country. The immediate consequence is iron deficiency anemia, which is often seen as being physically very tired, slow in learning and unmotivated, and not being able to work or study. Longer term deficiency can result in increased infections, heart and lung problems, and issues with women’s menstruation.



Source: WHO, 2008 and WHO, 2009

GOOD NUTRITION FOR BURKINABÉS

Benin Food Guide

Burkina Faso has yet to develop a complete food guide for Burkinabés. The country of Benin shares a border with Burkina Faso. Benin's government and Pôle DFN (Double Fardeau Nutritionnel), the Double Burden of Malnutrition project in West Africa, has designed a useful guide for healthy eating. It tells people what kinds of foods to eat and how much to eat each day for a healthy diet.

A balanced diet means eating from the different food groups. The 5 food groups recommended by the food guide are:

- **Milk and Dairy Products**
- **Fruits**
- **Vegetables**
- **Protein Foods**
- **Cereals and Tubers**

The recommended portion for each food group is different for each age group:

Daily Portions

Food Groups	Children			Adolescents		Adults			
	Age 2-3	Age 4-8	Age 9-13	Age 14-18		Age 19 and over			
	Girls and Boys			Girls	Boys	Women	Men	Breastfeeding Mothers	Pregnant Mothers
Cereals and Tubers	2-3	2-4	4-5	4-6	5-7	3-5	4-6	5-6	4-6
Protein Foods	1	1-2	1-2	2-3	2-3	2-3	2-3	2-3	2-3
Vegetables	2-3	3-5	4-5	4-6	5-6	4-6	4-6	4-6	4-6
Fruits	1	1-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3
Milk and Dairy Products	1	1	1	1-2	2	1-2	1-2	1-2	1-2

Source: PoleDNF, 2014

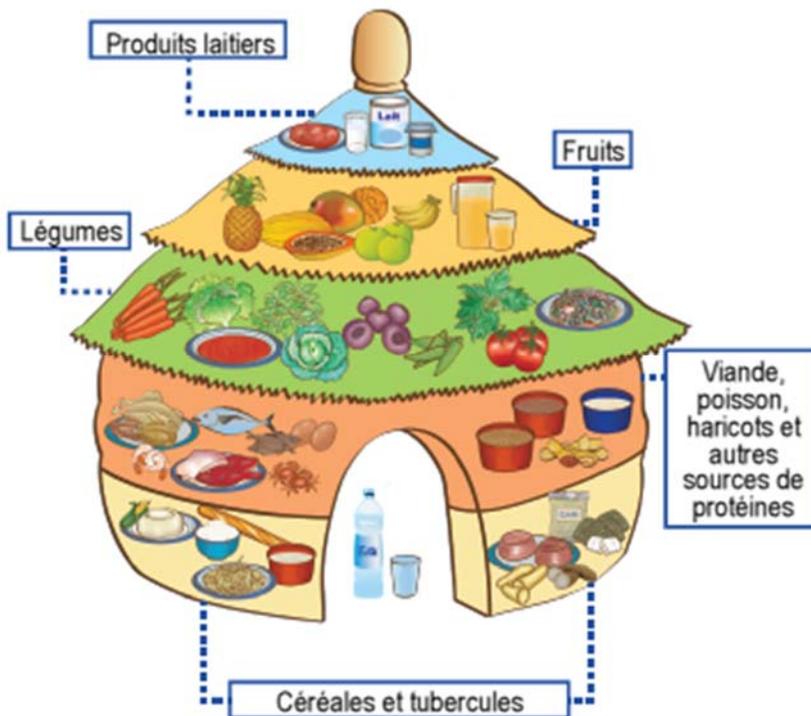
Apart from guidelines for eating, the food guide recommends:

1. Regular physical activity
2. Eat vegetables such as tomato, eggplant, carrots and green leafy vegetables every day in sauce or by itself
3. Eat fruits every day
4. Drink carbonated and sugary beverages in moderation
5. Limit daily alcohol consumption to 1 small bottle of beer (300-330 ml), 3/4 bamboo cup of wine (150 ml), or 1 shot of strong alcohol (45 ml)
6. Avoid too much salt

7. Eat fish often. If there are no meat, fish or eggs, replace with beans, peanuts, soybean, cheese or peas
8. Limit using oil in cooking
9. Conserve and teach your children traditional cuisine
10. Check your weight and tension of your arteries

The guide also recommends drinking plenty of clean water daily.

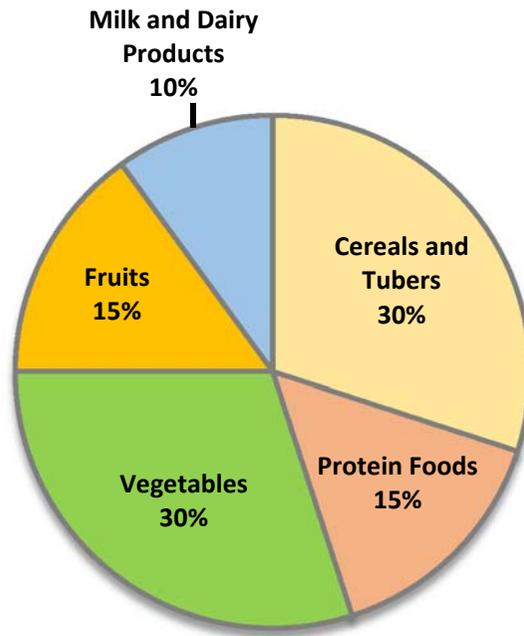
The food guide is represented by the hut illustration below:



Source: PoleDNF, 2014

According to the food guide, the recommended daily portions of foods eaten from each food groups can be roughly represented in the plate below:

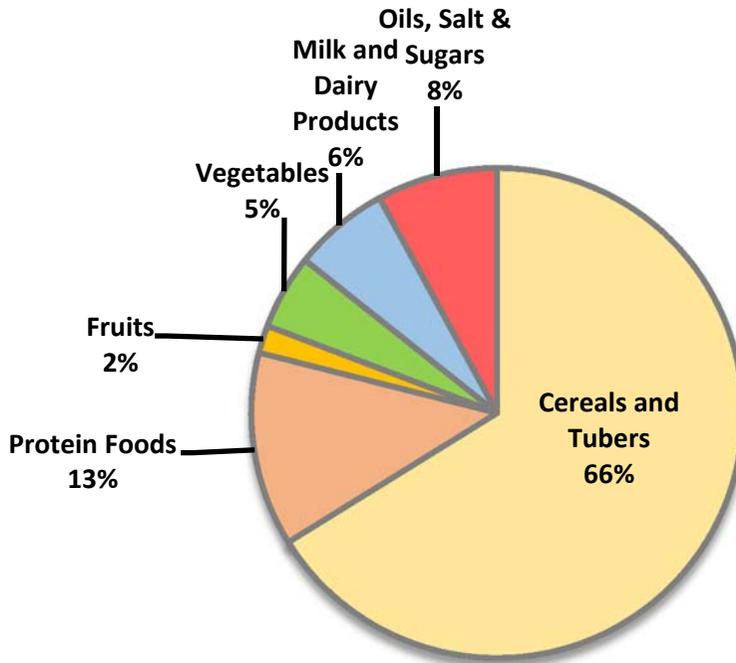
Balanced Diet Plate



Burkina Faso Food Patterns

Let us take a closer look at what kinds of foods are available for Burkinabés. The chart below shows the distribution of foods available daily for each person.

Food Availability in Burkina Faso



Source: FAOSTAT, 2014

Cereals and tubers make up more than half of the foods available in the Burkinabé food supply, followed by oils, salts and sugar, some protein foods, milk and dairy products, vegetables and fruits.

Compared to the Balanced Diet Plate above, the supply of cereals and tubers is 36 percent higher than recommended. People have more cereals and tubers than foods from other food groups. Protein foods, vegetables, and fruits are lower than the recommended amount. Moreover, oils, salt and sugars take up a large portion of the food supply and should be eaten in small quantities.

Simple modifications to eat more protein foods, vegetable, fruits and milk and dairy products, and less cereals and tubers and oils, salt and sugar in the diet will make the diet more balanced.

The specific food items available daily for each person (per capita) are listed below:

Food Availability in Burkina Faso	
Food Items	g/capita/day
Cereals and Tubers	
Cereal	578
Starchy Roots	39
Protein Foods	
Meat	44
Offal	7
Animal Fats	2
Eggs	7
Fish, Seafood	19
Pulses	39
Tree Nuts	2
Vegetables	
Vegetables	46
Fruits	
Fruits	17
Milk and Dairy Products	
Milk	59
Oils, Salt & Sugars	
Vegetable Oils	17
Oil Crops	37
Sugar Crops	-
Sugar & Sweeteners	20
Energy (kcal)	2655

Source: FAOSTAT, 2014

NUTRITION THROUGH LIFE



Good nutrition is especially important for infants, children, adolescents, pregnant and breastfeeding women, and elderly people.

Newborn infants (0-6 months old): It is recommended by the World Health Organization (WHO) to feed only mother's breast milk to infants from 0 – 6 months of age. Breast milk is the best source of nutrition for newborn infants.

Breast milk:

- Provides all the nutrients a baby needs
- Is easily digested and used by the baby's body
- Is clean and safe
- Protects against infections
- Helps the bonding between mother and baby
- Costs less than infant formula or cow's milk



Infants (6 months and older): Start feeding soft and healthy foods to infants by 6 months of age along with mother's breast milk. When preparing food for babies, it is important to use boiled and clean water. Start with small amounts of soft foods and increase the amount as the baby grows. Mothers can continue to breastfeed their children until they are ready to be weaned.

Foods suitable for babies at this age include:

- Soft, well-cooked and clean porridge made from cereals and

legume flour

- Well-cooked vegetables, fruits, meats, fish and eggs
- Add a small amount of oil or fat to the baby's food
- Give healthy snacks (for example: fruits, boiled potato, sweet potato, or taro, and snacks made from cereals/legume flours)

Older children and adolescents: Eat three healthy meals a day (breakfast, lunch, and dinner) to help children grow, study and play. Adolescents need greater amounts of nutritious foods than children as they are growing fast and becoming adults.



Foods suitable for older children and adolescents:

- Cooked potato and sweet potato or whole grain rice and porridge made from wholegrain cereals eaten with milk, eggs, other animal foods, fruits and vegetables



Pregnant and breastfeeding women: Eating nutritious meals many times throughout the day will help mothers provide important nutrients for their babies' growth.

- Eat more animal foods (for example: meat, fish, poultry, dairy, eggs)
- Eat more colored (yellow, orange, red, purple) fruits and vegetables, and dark leafy green vegetables
- Eat extra snacks (for example: a fruit, a vegetable, a starchy tuber, a bowl of porridge) to provide more nutrients during pregnancy and breastfeeding
- Avoid smoking tobacco and drinking beverages with high amounts of caffeine and alcohol during this time



Elderly people: As people age, nutrition is especially important to keep the body strong against diseases.

- Eat more small portions and frequent healthy meals
- Avoid foods high in fat and salt
- Eat soft and well-cooked foods



HEALTH BENEFITS OF VEGETABLES



Vegetables are an important part of a healthy diet and provide many health benefits. They are especially rich in fiber, vitamins and minerals.

Vegetables are low in fat. They are good foods for keeping our weight healthy. Eating vegetables can help reduce illnesses such as high blood pressure, high blood glucose or diabetes, heart diseases, obesity, cancers, eye and digestive problems.

What are the nutrients in vegetables that help keep my body healthy and strong?

FIBER in vegetables helps good **DIGESTION** for healthy stomachs

Almost all vegetables are good sources of fiber

Ash gourd



Bitter gourd



Eggplant



Beans



PROTEIN in vegetables builds **MUSCLES** that helps our arms, legs, and body move

Peas and beans are good sources of protein

Peas and beans



CALCIUM in vegetables builds healthy **BONES, TEETH** and **NAILS**

Dark green leafy vegetables are good sources of calcium

Amaranth



Drumstick



Spinach



IRON in vegetables is good for our **BLOOD** and protects against **ANEMIA**

Dark green leafy vegetables are good sources of iron

Amaranth



Pumpkin leaves



Ridge gourd leaves



Spinach



VITAMIN A in vegetables keeps our **EYES** healthy and prevents **NIGHT BLINDNESS**

Orange-colored vegetables and dark green leafy vegetables are good sources of Vitamin A

Carrot



Pumpkin



Sweet potato



Malabar spinach



Amaranth



Spinach



VITAMIN C in vegetables helps heal **WOUNDS** and **CUTS**

Most vegetables are good sources of Vitamin C

Bitter melon



Cauliflower



Amaranth



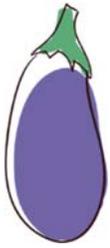
Kohlrabi



Functions and sources of main nutrients present in vegetables

Nutrient	Role/Function	Vegetable Sources
Fiber	<ul style="list-style-type: none"> • Aids proper digestion of foods and maintains healthy stomach and intestines • Makes the food bulkier and gives the feeling of fullness • Absorbs water and makes the stools soft, which prevents constipation and other gut-related diseases such as diverticulitis • Reduces cholesterol and glucose absorption, lowering the risk of heart diseases and diabetes • Promotes good gut bacteria that aids in digestion and absorption of nutrients 	<p><i>Almost all vegetables</i></p> <p>Examples: Cabbage, cowpea leaves, cassava leaves, kale, roselle, yam</p>
Minerals		
Calcium	<ul style="list-style-type: none"> • Helps build strong bones and teeth • Maintains normal heart and muscle functions • Helps blood clotting and regulation of blood pressure • Important in immune functions 	<p><i>Most dark green leafy vegetables</i></p> <p>Examples: Amaranth, cassava leaves, cowpea leaves, kale, moringa, roselle, spinach</p>
Iron	<ul style="list-style-type: none"> • Makes red blood cells • Helps brain and immune functions • Plant-based iron is not as efficiently absorbed as animal-based iron 	<p><i>Most dark green leafy vegetables and beans</i></p> <p>Examples: Amaranth, cassava leaves, cowpea leaves, moringa, sweet potato leaves</p>

Nutrient	Role/Function	Vegetable Sources
Vitamins		
Vitamin A	<ul style="list-style-type: none"> • Beta-carotene is found in high amounts in orange and yellow vegetables • In the body beta-carotene is converted to vitamin A • Essential for maintaining healthy skin, immune system, vision and promote normal growth and development • Fat soluble vitamin • Eating or cooking orange and vegetables with a small amount of oil can promote absorption of vitamin A 	<p>Orange colored vegetables Examples: Carrot, pumpkin, squash</p> <p>Dark green leafy vegetables Examples: Amaranth, cassava leaves, cowpea leaves, kale, moringa, roselle, sorrel, spinach, sweet potato leaves</p>
Vitamin C	<ul style="list-style-type: none"> • Helps heal cuts and wounds and keeps teeth and gums healthy • Aids in iron absorption and uses calcium and other nutrients in building the body • Water soluble vitamin, can easily be lost when food is cut, heated or boiled for a period of time 	<p>Most vegetables Example: Amaranth, cabbage, chili, sorrel, sweet pepper</p>
Folate (Folic acid)	<ul style="list-style-type: none"> • Helps body form red blood cells and other cells • Reduces the risk of central nervous system in developing fetus such as neural tube defects, spina bifida, and anencephaly 	<p>Beans and leafy vegetables Example: Amaranth, bitter gourd, Malabar spinach, moringa, snap bean, spinach, taro leaves, and yard-long bean</p>



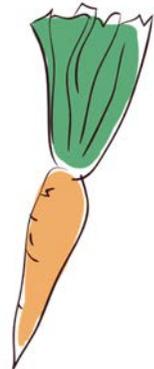
Do all vegetables have the same kind of nutrients?

No. Every vegetable contains different amounts of nutrients that are good for our body. Eating one type of vegetable cannot supply all the nutrients our body needs for good health. **It is important to eat 2-3 types or more of vegetables every day or every week to have a variety of nutrients for good health.**

How many vegetables should I eat?

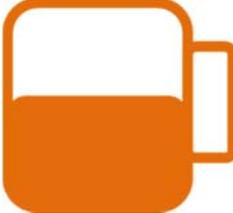
The World Health Organization suggests eating **at least 200 g of vegetables and 200 g of fruits every day.** Since vegetables are low in sugar and fat, eating more than 5-7 servings a day is encouraged.

An easy way to estimate serving size is using the adult fist. One serving of cooked vegetables or raw, leafy greens similar to the size of a fist would be considered one serving size.



Portion size for 1 serving of vegetable

1 serving of vegetable is equivalent to 75-80 g of vegetables		
OR	1 cup* of raw leafy vegetables	

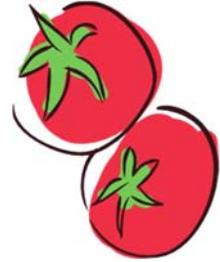
OR	1/2 cup* of non-leafy vegetables	
OR	1/2 cup* of cooked or canned vegetables	
OR	1/2 cup* of vegetable juice	
OR	Vegetables the size of an adult fist	
*1 cup = 250 ml		

What type of vegetables should I eat?

When selecting vegetables, it is important to choose vegetables that are fresh and in season. Eat different types and colors of vegetables, such as dark leafy greens, bright orange, red, yellow and dark purple vegetables to add diverse nutrients to your plate.

Eating one single type or color of vegetable will not help meet daily nutrient needs. It is important to eat many types of vegetables every day or during the week.

For example, orange-colored vegetables (such as carrot) are especially rich in vitamin A, especially good for eyes. Red-colored vegetables such as tomatoes and red peppers are especially high in antioxidants called lycopene and capsanthin. Dark green vegetables are good sources of folate and minerals. Purple vegetables contain antioxidants. All these nutrients have protective effects on many important body organs such as the eyes, heart, lungs, liver, and digestive system.



How do I use vegetables?

Clean vegetables thoroughly before cutting or cooking

Eat vegetables raw, blended in juices or cooked in any family dishes



Before cooking or eating, it is important to handle fresh vegetables safely. Be sure to wash the vegetables thoroughly with clean water to remove any dust, bacteria and pesticide residues. Only scrub vegetables with a tough outer skin (for example, carrots, cucumbers, and pumpkins) that do not bruise easily.

Use a clean chopping board to cut vegetables. If possible, use a separate chopping board for fruits and vegetables and another one for raw meats.

Vegetables can be eaten raw, blended into juices or prepared with any suitable cooking methods such as boiling, steaming, stir-frying, stewing and braising. To maximize the nutrient content of vegetables, it is recommended not to cook for a long period of time at a high temperature. It is advisable to avoid adding too much salt, sugar and cooking oil.

Generally, raw vegetables are highly nutritious, as cooking can reduce the nutrient content. However, adding a small amount of cooking oil, preferably vegetable oil, when eating and cooking can increase the absorption of fat-soluble vitamins (vitamin A, D, E, and K) in vegetables. Water-soluble vitamins (vitamin B and C) are easily lost through heat, and in the water when boiled. Minerals that are resistant to heat can also be lost in the cooking water. Therefore, the cooking water or left-over broth should be saved for use in soups, juices, and sauces to maximize the nutritional benefits of vegetables.

Grow your own vegetables!

Apart from buying vegetables, why not grow your own vegetable garden to feed your family?

- Grow vegetables near your home
- Grow different types of vegetables
- Grow vegetables all year round
- Harvest, eat and share the treasures from your garden
- Raise fish and livestock to add more nutritious foods for your family



NAMES OF COMMON VEGETABLES

Crop name	French/Local name	Scientific name
Amaranth	Amarante	<i>Amaranthus</i> spp.
Cabbage	Chou	<i>Brassica oleracea</i> L. Capitata Group
Carrot	Carotte	<i>Daucus carota</i>
Cassava	Manioc	<i>Manihot esculenta</i>
Chili	Piment fort	<i>Capsicum annum</i>
Cowpea (leaves)	Niébé (feuilles)	<i>Vigna unguiculata</i>
Cucumber	Concombre	<i>Cucumis sativus</i>
Eggplant	Aubergine	<i>Solanum melongena</i>
French bean	Haricot vert	<i>Phaseolus vulgaris</i>
Garlic	Ail	<i>Allium sativum</i>
Kale	Chou fris�	<i>Brassica oleracea</i> L. Alboglabra group
Lettuce	Laitue	<i>Lactuca sativa</i>
Moringa (leaves)	Ben ol�if�re, (feuilles)	<i>Moringa oleifera</i>
Okra	Gombo	<i>Abelmoschus esculentus</i>
Onion	Oignon	<i>Allium cepa</i> L. Cepa group
Roselle (leaves)	Oseille de Guin�e (feuilles)	<i>Hibiscus sabdarifa</i>
Sorrel	Sorrel	<i>Rumex acetosa</i>
Spinach	�pinards	<i>Spinacia oleracea</i>
Squash	Courge/citrouille	<i>Cucurbita maxima, C. mixta</i>
Sweet pepper	Poivron	<i>Capsicum annum</i> var. <i>annuum</i> Grossum group
Sweet potato (leaves)	Patate douce (feuilles)	<i>Ipomoea batatas</i>
Tomato	Tomate	<i>Solanum lycopersicum</i>
Yam	Ignam (racine)	<i>Dioscorea</i> spp.
Zucchini	Courgette	<i>Cucurbita pepo,</i>



Amaranth



Cabbage



Carrot



Cassava



Chili



Cowpea (leaves)



Cucumber



Eggplant



Local eggplant (kumba)



French bean



Garlic



Kale



Lettuce



Moringa (leaves)



Okra



Onion



Roselle (leaves)



Sorrel



Spinach



Squash



Sweet pepper



Sweet potato (leaves)



Tomato



Yam



Zucchini

VEGETABLE PLANTING CALENDAR

Crop name	Sowing time	Harvesting time
Amaranth	Year-round	Year-round
Cabbage	Oct.-Nov.	Jan.-Feb.
Carrot	Oct.-Dec.	Jan.-Mar.
Chili	Year-round	Year-round
Cowpea (leaves)	Jul.	Sept.-Oct.
Eggplant	Year-round	Year-round
French bean	Year-round	Year-round
Garlic	Year-round	Year-round
Kale	Year-round	Year-round
Lettuce	Sept.-Mar.	Sept.-Mar.
Moringa (leaves)	Year-round	Year-round
Okra	Year-round	Year-round
Onion	Oct.	Mar.-May
Roselle	Year-round	Year-round
Sorrel	Year-round	Year-round
Squash	Year-round	Year-round
Sweet potato (leaves)	Year-round	Year-round
Tomato	Year-round	Year-round

Sources:

FAO (2010). FAO Crop Calendar. FAO Agriculture Production and Protection Division. Retrieved in May 2014.

<http://www.fao.org/agriculture/seed/cropcalendar/searchbycountry.do>

NUTRITIONAL INFORMATION OF VEGETABLES

		Nutrients in 100 g of vegetable				
		Energy	Protein	Fat	Carbohydrate	Fiber
English Name	French Name	kcal	g	g	g	g
Amaranth	Amarante (feuilles)	39	4	0	5	1
Cabbage	Chou	28	2	0	4	3
Carrot	Carotte	35	1	0	6	3
Cassava (roots)	Manioc (feuilles)	97	8	1	13	4
Chili	Piment fort	45	2	0	8	2
Cowpea (leaves)	Niébé (feuilles)	42	5	0	3	4
Cucumber	Concombre	15	1	0	3	1
Eggplant	Aubergine	30	1	0	5	3
French bean	Haricot vert	40	3	0	5	3
Garlic	Ail	135	7	0	25	2
Kale	Chou frisé	49	4	1	9	4
Lettuce	Laitue	18	1	0	2	1
Moringa (leaves)	Ben oléifère, (feuilles)	364	8	1	10	2
Okra	Gombo	33	2	0	4	3
Onion	Oignon	37	1	0	7	2
Roselle	Oseille de Guinée (feuilles)	40	3	0	4	5
Sorrel	Sorrel	35	2	0	6	
Spinach	Épinards	28	3	1	2	2
Squash	Courge/citrouille	29	1	0	6	1
Sweet pepper	Poivron	27	1	0	6	1
Sweet potato	Patate douce (feuilles)	51	4	0	7	2

		Nutrients in 100 g of vegetable				
		Energy	Protein	Fat	Carbohydrate	Fiber
English Name	French Name	kcal	g	g	g	g
(leaves)						
Tomato	Tomate	22	1	0	3	1
Yam	Ignam (racine)	128	2	0	28	4
Zucchini	Courgette	17	1	0	3	1

		Nutrients in 100 g of vegetable				
		Calcium	Potassium	Iron	Vitamin A	Vitamin C
English Name	French Name	mg	mg	mg	µg (RE)	mg
Amaranth	Amarante (feuilles)	380	602	6	482	45
Cabbage	Chou	41	317	1	16	54
Carrot	Carotte	35	266	1	1426	7
Cassava (roots)	Manioc (feuilles)	276	605	6	572	39
Chili	Piment fort	16	331	1	106	193
Cowpea (leaves)	Niébé (feuilles)	265	475	5	300	57
Cucumber	Concombre	13	134	1	6	14
Eggplant	Aubergine	13	264	1	6	6
French bean	Haricot vert	47	242	1	48	18
Garlic	Ail	32	533	2	0	18
Kale	Chou frisé	150	491	1	1000	120
Lettuce	Laitue	27	204	1	186	5
Moringa (leaves)	Ben oléifère, (feuilles)	434	404	6	1476	164
Okra	Gombo	84	303	1	52	28
Onion	Oignon	25	183	0	0	10
Roselle	Oseille de Guinée (feuilles)	212	437	4	430	33

		Nutrients in 100 g of vegetable				
		Calcium	Potassium	Iron	Vitamin A	Vitamin C
English Name	French Name	mg	mg	mg	µg (RE)	mg
Sorrel	Sorrel	70	340	2	650	120
Spinach	Épinards	133	502	3	818	36
Squash	Courge/citrouille	19	280	1	200	8
Sweet pepper	Poivron	11	212	0.5	20	184
Sweet potato (leaves)	Patate douce (feuilles)	37	522	4	978	11
Tomato	Tomate	13	255	1	104	30
Yam	Ignam (racine)	26	816	1	4	13
Zucchini	Courgette	16	261	0	20	18

Sources:

FAO. (2012). *West African Food Composition Table 2012*. Food and Agriculture Organization of the United Nations in partnership with International Network of Food Data SYSTEMS (INFOODS), West African Health Organisation (WAHO) and Bioversity International, Rome.

U.S. Department of Agriculture, Agricultural Research Service. (2012) *USDA National Nutrient Database for Standard Reference*, Release 25. Nutrient Data Laboratory Home Page, <http://www.ars.usda.gov/ba/bhnrc/ndl>

WorldVeg Nutrient Database, <http://www.avrdc-nudb.org/>

VEGETABLE RECIPES

Riz Au Gras

<p>Préparation: 30 minutes</p> <p>Cuisson: 1 heure</p> <p>Ingrédients: Viande Huile Oignon Tomates Poivron sel choux aubergines gombo persil ail céleri pâte de tomate bouillon de cube poivre</p>	<p>Technique:</p> <ol style="list-style-type: none">1. Mettre la marmite au feu et y verser un verre d'huile2. Faire revenir dans de l'huile chaude, la viande, les oignons, les tomates, poivron découpés.3. Ajouter le persil, céleri, ail écrasé4. Ajouter la pâte de tomate5. Ajouter le bouillon de cube6. Laisser mijoter7. Mettre l'eau, les légumes (choux, aubergines découpés en quatre et le gombo).8. Ajuster l'assaisonnement (sel, poivre) Laisser bouillir pendant 30 minutes. Enlever le légumes (choux, aubergines découpés en quatre et le gombo)9. Laver le riz et mettre dans la sauce10. Couvrir et laisser cuire. Vérifier de temps en temps la cuisson11. Servir chaud
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Riz Blanc À La Sauce De Pâte D'Arachide

<p>Préparation: 30 minutes</p> <p>Cuisson: 1 heure</p> <p>Ingédients:</p> <p>Viande Huile Oignon Tomates Poivron Sel Choux Aubergines Gombo Persil Ail Céleri Pâte de tomate Épinards Pâte d'arachide Bouillon de cube Poivre</p>	<p>Technique:</p> <ol style="list-style-type: none">1. Mettre la marmite au feu et y verser un verre d'huile2. Faire revenir dans de l'huile chaude, la viande, les oignons, les tomates, poivron découpés.3. Ajouter le persil, céleri, ail écrasé4. Ajouter la pâte de tomate5. Ajouter le bouillon de cube6. Laisser mijoter7. Mettre l'eau et laisser bouillir8. Ajouter la pâte d'arachide9. Ajouter les légumes (choux, aubergines découpés en quatre et le gombo), les épinards et laisser bouillir10. Ajuster l'assaisonnement (sel, poivre) <p>Cuisson du riz</p> <ol style="list-style-type: none">1. Mettre l'eau à bouillir2. Laver le riz3. Mettre le riz et laisser cuire à point
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Riz Blanc À La Sauce Légumes

<p>Préparation: 30 minutes</p> <p>Cuisson: 1 heure</p> <p>Ingédients:</p> <p>Viande Huile Oignon Tomates Poivron Sel Choux Courgettes Aubergines Gombo Persil Ail Céleri Pâte de tomate Bouillon de cube Poivre</p>	<p>Technique:</p> <ol style="list-style-type: none">1. Mettre la marmite au feu et y verser un verre d'huile2. Faire revenir dans de l'huile chaude, la viande, les oignons, les tomates, poivron découpés.3. Ajouter le persil, céleri, ail écrasé4. Ajouter la pâte de tomate5. Ajouter le bouillon de cube6. Laisser mijoter7. Ajouter les courgettes râpées8. Laisser mijoter9. Mettre l'eau et laisser bouillir10. Ajouter les légumes (choux, aubergines découpés en quatre et le gombo et laisser bouillir11. Ajuster l'assaisonnement (sel, poivre) <p>Cuisson du riz</p> <ol style="list-style-type: none">1. Mettre l'eau à bouillir2. Laver le riz3. Mettre le riz et laisser cuire à point
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Tô À La Sauce Gombo Ou Sauce De Feuilles D'Oseille

<p>Préparation : 30 minutes</p> <p>Cuisson: 1 heure</p> <p>Ingrédients: Farine de maïs Citron</p>	<p>Technique:</p> <ol style="list-style-type: none">1. Mettre de l'eau dans la marmite et déposer sur le feu2. Lorsque l'eau boue, délayer un peu de farine pour faire la bouillie et ajouter immédiatement le jus de citron3. Laisser cuire pendant 10 minutes pour obtenir une bouillie moyennement épaisse4. Réserver à peu près la moitié de cette bouillie dans un récipient à côté de la marmite. Diminuer le feu5. Verser le reste de la farine en malaxant.6. 15 minutes après, ajouter la bouillie réservée7. Malaxer encore 15 minutes avant de servir avec une sauce (gombo ou feuille d'oseille)
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Sauce Gombo Frais

<p>Préparation: 30 minutes</p> <p>Cuisson: 1 heure</p> <p>Ingrédients:</p> <p>Viande Huile Oignon Tomates Poivron Sel Aubergines Gombo frais Persil Ail Céleri Pâte de tomate Bouillon de cube Soubala (à base de graines de néré) Levure de la bière de dolo (rabilé) Potasse Poudre de poisson séchée</p>	<p>Technique:</p> <ol style="list-style-type: none">1. Mettre la marmite au feu et y verser un verre d'huile2. Faire revenir dans de l'huile chaude, la viande, les oignons, les tomates, poivron découpés.3. Ajouter le persil, céleri, ail écrasé4. Ajouter la pâte de tomate5. Ajouter le bouillon de cube et laisser mijoter6. Ajouter les gombos découpés finement7. Ajouter un peu de potasse8. Remuer pour rendre la sauce gluante et laisser mijoter9. Mettre l'eau10. Ajouter les aubergines découpés en quatre11. Ajouter le soubala, la levure de la bière de dolo (rabilé), poudre de poisson séchée et laisser cuire12. Réduire le feu et laisser mijoter 3 minutes13. Ajuste l'assaisonnement (sel, poivre)14. Servir chaud avec le to
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Sauce De Feuilles D'Oseille Aux Arachides

Préparation: 30 minutes Cuisson: 1 heure Ingrédients: Viande Huile Oignon Tomate Piovron Feuilles d'oseille Poisson frais ou séché, fumé Graines d'arachides Soubala Sel Potasse	Technique: <ol style="list-style-type: none">1. Réduire en poudre les arachides2. Faire revenir dans de l'huile chaude, la viande, les oignons, les tomates, poivron découpés3. Mettre l'eau du soubala4. Ajouter le poisson, laisser cuire et ajouter les feuilles d'oseilles pendant 25 minutes5. Ajouter la poudre d'arachide, le sel et la potasse, laisser cuire 20 minutes6. Servir chaud avec du to
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Sauce De Feuilles De Baobab

Préparation: 30 minutes Cuisson: 45 minutes Ingrédients: Viande Huile Oignon Tomate Piovron Feuilles de baobab Poudre de poisson séché Graines d'arachides Soubala Sel Potasse	Technique: <ol style="list-style-type: none">1. Faire revenir dans de l'huile chaude, la viande, les oignons, les tomates, poivron découpés.2. Mettre l'eau3. Mettre le soubala pilé et laisser bouillir pendant 10 mn4. Ajouter la poudre de poisson5. Ajouter les feuilles de baobab pilées et laisser cuire pendant 25 minutes en y6. ajoutant un peu de potasse7. assaisonner et laisser mijoter pendant 5 minutes8. Servir chaud avec du to
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Sauce De Feuilles D'Aubergines Locales

<p>Préparation: 15 minutes</p> <p>Cuisson: 1 heure</p> <p>Ingrédients:</p> <p>Feuilles d'aubergine locale</p> <p>Feuilles de kénebdò (Cloème gynandra)</p> <p>Feuille d'amarante</p> <p>Huile</p> <p>Sel</p>	<p>Technique:</p> <ol style="list-style-type: none">1. Laver soigneusement les feuilles et égoutter2. Mettre la marmite au feu et porte à ébullition. Puis verser le mélange de feuilles3. Couvrir et laisser cuire pendant 309 minutes4. Retourner les feuilles et laisser encore cuire pendant 30 minutes5. Retirer du feu et laisser refroidir6. Presser les feuilles pour éliminer l'eau qu'elles contiennent7. assaisonner avec une sauce tomate ou avec du sel, huile8. Servir chaud avec du tô
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PROMOTION

SCHOOL PROMOTIONAL EVENTS

School is one of the best environments for students to learn about the benefits of growing vegetables, healthy eating and basic sanitation practices. With these hands-on and fun activities, students can apply what they have learned in practical ways and be rewarded.

Choose any of these events for your school to fully engage and stimulate your students' interests in the topic of gardening and health. A certificate can be awarded to students who participate in the events.

Take the Healthy Pledge

Students learn to take responsibility for their health and reflect on their achievements in committing to their pledge

At the beginning of the school year or semester, teachers distribute indexed pledge cards to students with the pledge: "I promise to eat more vegetables and wash my hands before I eat."

Students sign and date their cards, and post them on a board or wall in the classroom. The pledge board is a reminder of the commitment each student has made. The teacher can refer to the pledge board during lessons on nutrition and health.

Each student takes five (or more) pledge cards to distribute to their family members and neighbors, asking them to also sign the pledge.

At the end of the year, each student interviews one of the people they gave a pledge card to, and asks them if they were able to follow the pledge and what changes they made to their daily routine as a result of taking the pledge. In the classroom, students discuss their own achievements and challenges on committing to the pledge and the responses they have collected from their family and friends.

HEALTHY PLEDGE

I promise to eat more vegetables and wash my hands before I eat.

(Print name)



(Signature)

(Date)

Veggie Spokesperson

Students will be encouraged by their peers to participate in school events

Each school or class chooses 2-3 student veggie spokespeople who will help promote school events and raise awareness on topics related to vegetables, gardening, nutrition and health to the students. Veggie spokespeople will wear a special pin or hat for students to recognize them. Teachers and spokespeople will meet to plan fun and engaging events that will promote growing and eating vegetables in the school and community.



They will announce school events, competitions and distribute promotional materials. Leading by example, the spokespeople will eagerly participate in the events and encourage active student participation.

Vegetable of the Month

Students learn about a vegetable every month

Every month, feature one vegetable in the school and incorporate this vegetable in the lesson plans and school events. If schools have feeding programs, include the vegetable in the meals. This promotion is designed to expose students to the vegetable many times in the whole month. The goal is to increase students' knowledge and excitement about the vegetable, which will help encourage eating more vegetables.



Ideas to promote the Vegetable of the Month include:

- An announcement to present the monthly vegetable
- Teach students about the nutritional value of the vegetable
- Tell stories that mention the vegetable
- Distribute newsletters about the vegetable with fun facts, recipes, and activities for students and their families to enjoy
- Include at least one meal with the vegetable in the lunch program
- Hold a vegetable tasting session

Cook and Taste Veggies

Students learn how to cook vegetables from the garden and share a meal with their classmates

After harvesting vegetables from the garden, it is a good time to teach students how to cook these vegetables. Find a simple recipe using local and available ingredients. Show them how to clean and wash the vegetables, chop, cook, and season the dish. Ask student volunteers to help throughout the cooking process and to distribute the dish to the class.



For younger students, cooking and cutting can be handled by the teacher or an adult community volunteer. For older students, the class could be divided into groups of 5-10 students and each group can cook a vegetable dish.

The students will be able to make a vegetable dish and taste the vegetables they have harvested. Have the students discuss what they learned in the cooking session, how they like/dislike the taste of the vegetable, and the nutritional benefits of the dish. Finally, encourage the students to cook the same recipe at home with the family.

For schools with lunch programs, at least once a week, cook and serve students' vegetables harvested from the garden. Whenever vegetables are served, announce or write the vegetable names and their nutritional benefits on a board in the lunch room. Make it fun and exciting for students to eat vegetables.

Veggie Chefs

Students use creative ways to cook delicious vegetable dishes

Hold a cooking contest in the school! Depending on your school, the contest could be between classrooms, groups of 3-4 students, or individual students.



Choose a theme vegetable for the cooking contest. Ideas for theme could be:

- Vegetables from the Garden
- Vegetable of the Month
- Vegetables in Season (for example, in Autumn use vegetables harvested in this season)

The school can provide simple ingredients, such as the main vegetables, salt, sugar, and oil. Each participating group will create a dish that is both appealing and tasty. Encourage students to decorate the dishes in fun and creative ways. The dishes will be judged by a panel of 3-5 judges, which could be the school principal, teachers, staffs, parents, or important community members. Students who are not participating can taste the dishes and vote on their favorite dishes.

The dishes will be awarded based on:

- Taste
- Appearance
- Creativity
- Use of Themed Vegetable
- Popularity of the Dish

Students who win the top places in the contest will be named “Veggie Chef of the Year”.

Veggie Art Gallery

Students use art to create their vegetable masterpieces and display lively art in the school

Using drawing, painting or collage, ask students to create a picture of any of the following topics:

- Their favorite vegetable
- A vegetable they learned about
- School vegetable garden scene



Students are free to explore different art media and use any material to create the pictures. Each picture should have the student's name, class, and title of his/her work. The pictures will be hung in the classrooms and hallways to create a beautiful art gallery.

The school can have an art gallery day where parents and the local community are invited to visit the school and see the masterpieces created by the students. Each student can introduce the vegetable and their inspiration for the picture to the guests.

Make it a competition! Visitors and students can vote on their favorite pictures. At the end of the day, students with the highest votes will be awarded a special prize for the top pictures.

Veggie Stories

Students write about and share their experiences growing and eating vegetables, or practicing WASH



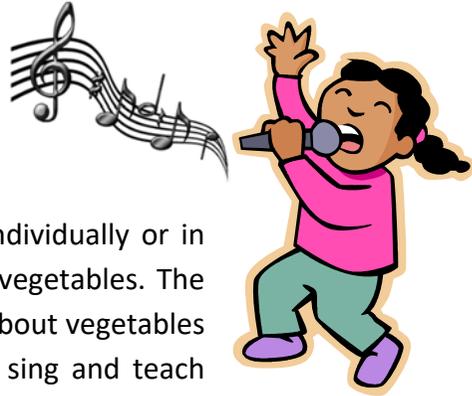
Ask the students to write about their experiences, what they have learned from the school garden, the nutrition and WASH lessons, and participating in the school promotional events. Challenge the students to come up with solutions to help encourage people to eat more vegetables and apply WASH in the school and community. Once a week, a couple of students will present their stories to the class. Students can ask questions and respond to each student's story. The best personal stories will receive an award.

Voice it Out! From each class, select a couple of students with the best stories. During the school assemblies, have the students share their stories to the whole school.

Sing the Veggie Song

Students write songs to teach others about vegetables

Singing to a tune is one of the best ways to remember nutrition messages. Ask the students, either individually or in groups of 4-5 to make a song about vegetables. The song should help people know more about vegetables and their benefits. The students will sing and teach their song to the class.



Make it a Motto Song! Students can vote on their favorite songs. The song with the highest vote can be named the school “Veggie Song”. The whole school will learn the song and sing it during school assemblies and events for the year.

FAMILY PROMOTIONAL EVENTS

Students can continue their learning at home and encourage their family to grow and eat vegetables. Sharing what they have learned at school can benefit the whole family.

Here is a list of ideas of family-oriented activities for everyone to enjoy!

Plant Your Own Home Garden

Students guide and help their family establish a home garden

In class, distribute small packets of vegetable seeds to each student to bring home. Ask the students to plan and grow a home garden with their family. Using the gardening skills and knowledge learned in class, students can guide their family through the process.



If there is no space for a garden, vegetables can be grown in pots and containers as long as there is sufficient sunlight and water.

Each week, record the progress of the home garden and post the progress on a “My Home Garden” board in the classroom. The students are encouraged to share about their home garden in the class.

Home Veggie Meals

Students learn to cook vegetables with their family

Students can ask their parents to help them cook a meal with vegetables. The vegetables could be harvested from the school garden, home garden, or

bought from the market. The parents could teach them how to cook a local vegetable dish. Students can also share recipes they have learned in school.



During the cooking process, the students can write down the ingredients and cooking instructions to share with the class.

During dinner time, students can share with their family the nutritional benefits of these vegetables.

Family Day – Show and Tell

Students show their family the vegetables in the school garden

On School Garden Day, students invite their family to the school garden. Students act as guides and show their family the vegetables in the garden.

Students also describe their experiences in tending the garden and teach about the nutritional benefits of vegetables.

During the garden day, the school can organize some fun family activities for parents and children to join. Ideas include:

- Vegetable tasting sessions
- Vegetable quizzes and trivia
- Transplant seedlings to the garden
- Vegetable arts and crafts – make a decoration for the home
- Relay or obstacle course races around the garden



COMMUNITY PROMOTIONAL EVENTS

Involving the community in school programs can help students raise awareness about growing and eating vegetables. The school interaction with the community is important for establishing friendly and long-lasting mutual support for learning and sharing resources. Students will be able to apply what they learn in the classroom to promote real change in the community.

Poster Promotion

Students design attractive posters to promote vegetables in the community

From the lessons learned at school, students can design and make posters to promote vegetables in the community. The posters will have key promotional messages and images to raise awareness

about the benefits of eating and growing vegetables. Each class can discuss the importance of vegetables and the messages they would like the public to know. The posters should be attractive and easy to understand.



The posters can be posted on announcement boards or in public locations where people from the community gather. In some locations, permission from responsible local authorities must be obtained before putting up the posters.

Drama Promotion

Students perform skits in community events to promote vegetables

Each class performs a skit to promote growing and eating vegetables to the public. As a class, the students will write their own script and make their own props. The skits could include acting, dance, and music. Encourage the students to be creative and interact with audience.



On School Garden Day or in community events, the students will perform their skits for the public and teach them about the importance of vegetables.

Radio Promotion

Students take part in a local radio program to promote vegetables in the community

Connect with a local radio station. Brief the radio announcer on the topic of vegetables and nutrition, and the importance of growing and eating vegetables. Ask students from the school to promote the program date and time to their family, friends and neighbors, so they will listen to the program.



If possible, ask the radio staff if students from the school can promote vegetables on the radio. Choose 2-3 student representatives to join in the radio program to tell about their experiences growing vegetables and their importance in health.

The next day, ask students if they have listened to the program with their family and their responses.

Open School Garden Day

Students act as guides to the community in introducing vegetables grown in the school garden



Choose a day as the School Garden Day to open the school garden to the community. This day could also be combined with the Family Day. Before this day, students will prepare invitation cards to distribute in public areas and encourage people to participate in the event. Students can shout a slogan, perform a skit, or sing a song to promote the event. Students can also invite their family, friends and neighbors.

On the School Garden Day, students act as guides and show the public the school garden, simple gardening activities, and explain the nutritional benefits of eating vegetables.

The event could also include other fun activities for the community to participate in. Ideas include:

- Vegetable tasting sessions
- Vegetable quizzes and trivia
- Transplant seedlings to the garden
- Vegetable arts and crafts – make a decoration for the home
- Veggie Art Gallery (see School Promotional Events)
- Drama, songs and dance to promote vegetables

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