Nutrition Guidelines: Adolescence through Adulthood

for Persons with Prader-Willi Syndrome

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Introduction

This booklet is written for all individuals with Prader-Willi syndrome (PWS), their families and their caregivers. It is the authors' intent to help families of adolescents and adults with PWS by presenting tools and guidelines for setting realistic weight goals and planning a nutrition care plan that can be easily followed. Guidelines for younger children were revised in 2015 in the booklet entitled Nutritional Guidelines: Toddlers through Adolescence for Persons with Prader-Willi Syndrome which is available from the Prader-Willi Syndrome Association | USA.

Prader-Willi Syndrome is a genetic disorder affecting 1 in 10,000 - 15,000 individuals. Infants with PWS usually have early feeding difficulties caused by extreme muscle weakness that is an early characteristic of this syndrome. They may be slow to gain weight. The child then develops an insatiable appetite with excessive weight gain. This may occur as early as one to two years of age. PWS has many characteristics, the most challenging being the constant obsession with food. Most individuals with PWS feel hungry most of the time. While there is not yet any prescribed medical treatment for this hunger, there have been successes with weight control through diet, exercise, behavior management, and controlled living situations.

The worksheets found after the resources section of this booklet can be copied and enlarged and used with the corresponding text. The authors' intent is to provide practical tools for setting an appropriate weight goal, determining the proper caloric level, and then planning daily menus that fit within these parameters.

For more information on PWS, or state and local contacts, call Prader-Willi Syndrome Association | USA at (941) 312-0400.

A Practical Nutrition Guide for Adolescents and Adults with Prader-Willi Syndrome

By Karen H. Borgie, M.A., R.D.

Families of children with Prader-Willi syndrome (PWS) have a multitude of concerns as their children grow. One of the greatest challenges facing these families is nutrition and the management of the obesity that almost always accompanies this syndrome. After the early and usually difficult beginnings, they must face dealing with an insatiable appetite, an almost constant preoccupation with food, a caloric requirement that is less than that of most individuals and frequently, a strong dislike of physical activity. There is generally a range among individuals with these characteristics from mild to more severe.

For the adolescent or adult with PWS, access to a registered dietitian's nutritional assistance may not be readily available. Families/caregivers must continue to cope with planning a balanced diet that provides adequate nutrition without the extra calories that lead to weight gain. Supported living homes may or may not have access to a registered dietitian to do menus and calorie counts when needed. If a nutrition consultant is available, he or she can be very instrumental in setting up an appropriate calorie restricted menu. The purpose of this booklet is to help families and other caregivers to set realistic nutritional goals, and to select a method of diet planning that can be adapted to their living situation. This will improve health and minimize obesity and other related health problems that often accompany this complex syndrome. This booklet includes "worksheets" that provide step by step guidance for setting realistic weight goals and selecting and planning a diet plan for a young person or adult with PWS.

Setting a Realistic Weight Goal

Young people with PWS have a different body composition than do other people their age. Adolescents with PWS generally do not experience the usual growth spurt associated with puberty and therefore tend to remain short, without the use of growth hormone. They also have less lean muscle and a higher percentage of body fat, even when their weight is normal. For these reasons, the standard height/weight tables and the usual skinfold measurements may not be appropriate for use for those with PWS.

Many dietitians recommend using the Body Mass Index (BMI) to set a weight goal or desirable body weight. The BMI values are used to determine if an individual is of normal weight, is overweight or is obese. This method correlates more closely with body composition because it calculates weight in relationship to height. Nomograms (charts for easily calculating BMI) are found in many books on health and diet or may be calculated by using Worksheet 1 on page 16. Compare the BMI to the chart, “Guidelines for Goal Weights for Adults with PWS,” on page 17 of this booklet to see in which category the BMI falls.

Individuals with PWS can have slow and safe weight loss and then maintain that loss with careful attention to diet, exercise, and food security. If the person is morbidly or severely overweight, an appropriate goal, based upon the BMI, would be to lose enough weight to move from the “severely overweight” to the “overweight” range (see Table 3 on page 17). This would decrease health risks and be a realistic weight goal. Remember that the percentage of body fat for people with PWS will probably be greater than the standards for the general population.

A person with PWS should be weighed weekly at the same time of day, dressed in the same way, and on the same scale. Changes in weight can be noted quickly and diet, exercise and food access can be changed accordingly.

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Nutrition Needs

The basic nutritional needs of an individual with PWS are the same as those for any person. The greatest challenge is to provide as many of these nutrients from food, without exceeding the caloric allowance. Carbohydrates such as bread, vegetables and fruit are used by the body for energy and are a good source of vitamins and minerals. Protein, found in meat, eggs, dried beans, peas, and non-fat dairy products, is used by the body to build new tissue. Fats such as margarine, mayonnaise and salad dressings are concentrated sources of calories and should be avoided or eaten only occasionally.

Vitamin/Mineral Supplement

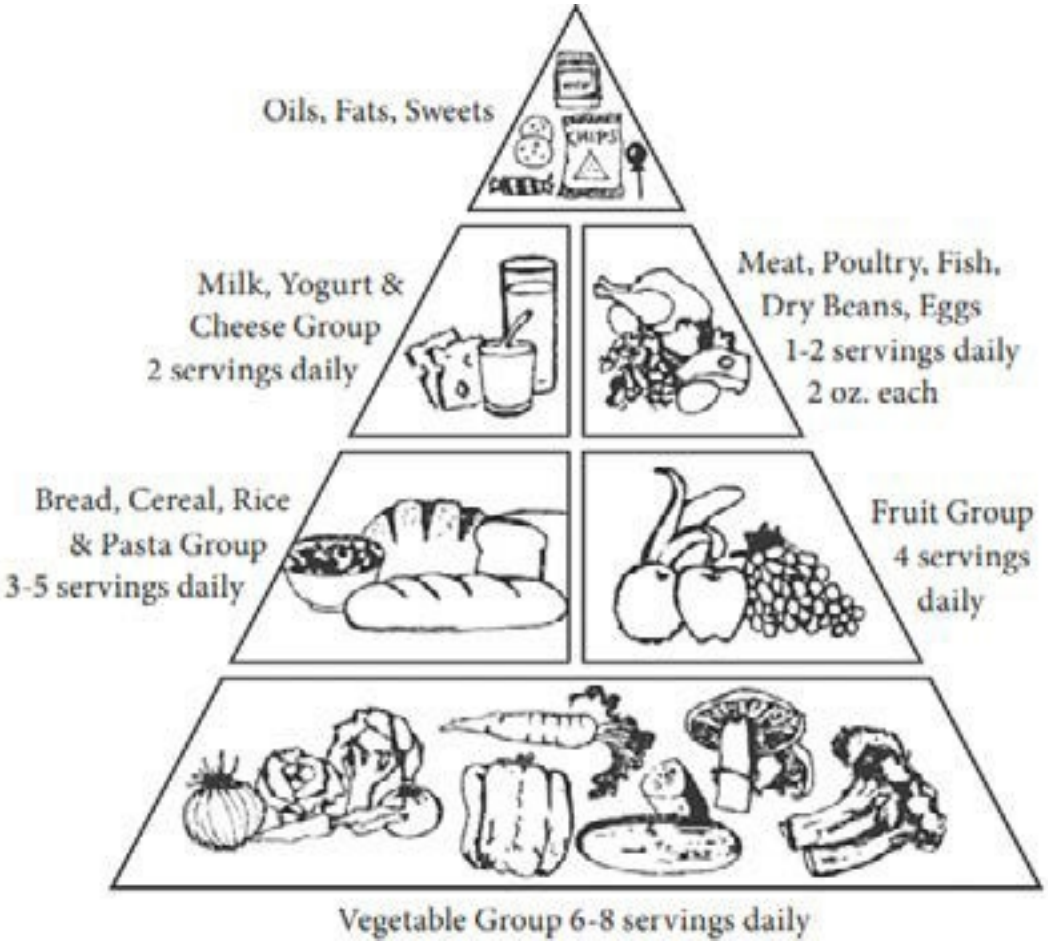
Whenever the daily caloric content of the diet is less than 1200 calories, a multivitamin/ mineral supplement is recommended. A supplement that supplies 100% of the RDA for vitamins and minerals for adolescents and adults is a good choice. If iron deficiency anemia has been a problem, consider a multivitamin with iron.

Calcium is an important mineral that is generally inadequate in low calorie diets. Osteoporosis is common among those with PWS and probably results from low calcium intake, failure to achieve sexual maturity, and physical inactivity. The Recommended Dietary Allowance for calcium is 1000-1300 milligrams per day through adulthood; however, individuals with PWS may need continued supplementation indefinitely at this level to prevent osteoporosis. A supplement that supplies at least 600 mg should be considered if two servings from the dairy group are consumed daily. Even better, try yogurt made from non-fat milk as it provides 1½ times more calcium than an equal volume of milk. You may want to ask your doctor or registered dietitian for a specific calcium recommendation. On the following pages are several tables for calcium fortified beverages and calcium supp

Food Pyramid Adapted for Prader-Willi Syndrome

The Food Guide Pyramid, published in 1993 by the U.S. Department of Agriculture, is designed to provide a graphic view of a healthy diet. The idea is excellent, but the U.S.D.A. Food Guide Pyramid cannot be used as is by an individual with PWS because it provides too many calories (about 2,000 per day). The following is a modified Pyramid that provides 800-1200 calories a day and can be used for either weight loss or maintenance by an individual with PWS. If an individual with PWS is diabetic, the pyramid is not appropriate as it may contain too many carbohydrates.

Figure 1 - A Prader-Willi Food Pyramid*



**Used by permission from Beverly Ekaitis, DTR. Developed for the Prader-Willi Syndrome Association | USA.*

In the modified Pyramid the food groups remain the same as the U.S.D.A. guide but the placement of the groups has been changed. The vegetable group is the base of the PWS pyramid and should be the foundation of the diet. Vegetables provide complex carbohydrates and contain the fewest calories and the most nutrients compared with foods from the other four food groups. The fruit and bread groups are found in the second level of the pyramid. Fruit servings include all fresh, canned, and dried fruit as well as fruit juices. The bread group includes bread, cereal, rice, and pasta. Starchy vegetables such as corn, potatoes and peas should also be included in this group because they are more like bread than vegetables in their calorie content. Dairy products (yogurt, milk, and cheese) should always be non-fat or low fat. The meat group includes meat, fish, poultry, eggs, cooked dried beans and peanut butter. Both the serving size and portions allowed have been reduced because this group contains significant amounts of fat and calories. Fats and sweets are extra foods found at the top of the pyramid and should be used rarely since all of these foods provide too many calories and very few nutrients.

Calorie Needs

Calorie needs depend upon an individual's height, physical activity, and the amount of muscle tissue. Because of the reduced muscle tissue in individuals with PWS, they need fewer calories every day. Calorie needs for those with PWS are based upon the individual's height. Weight maintenance can usually be achieved by following a diet that provides 20-25 calories for each inch of height. Weight loss can usually be obtained by planning a diet that provides 17-20 calories per inch (see Worksheet 2 on page 18). These figures are general recommendations and may need to be changed to meet individual needs. It is very important once a calorie range is established to monitor the individual's weight to determine the need for further calorie adjustments.

Although growth hormone does not have a direct effect on determining calorie needs, it can significantly improve linear growth, decrease fat mass, and increase lean mass. If exercise tolerance is improved, then calories may be able to be liberalized to account for the increased activity (if the individual is not already overweight).

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Adolescents need adequate calories to grow. If a young person is still growing, a severe caloric restriction for weight loss may slow linear growth, resulting in decreased height, and is not recommended.

If weight loss or maintenance does not occur when the access to food is strictly controlled and the calorie level is within these guidelines, consult a registered dietitian experienced with PWS.

Diet Planning

The next step after determining the daily caloric goal is to choose a system for planning meals that is easy to follow, provides for individual nutritional needs and stays within the calorie goals. The diet plan also has a better chance for success if it is fairly close to that of the other family members and if it regularly includes foods the young person likes. Carbohydrates should provide 50-55% of the total calories, protein should provide about 25% and fats should be 20-25% of the total calories.

When planning a daily diet, it is important to plan three meals and one or two snacks. Since those with PWS tend to be preoccupied with food, they function better when meals are planned ahead of time and served at regular times. Once meals are planned, menus should be posted to allow the individual to see what is being served daily.

“Nutrition Facts” Food Label

The “Nutrition Facts” food label can be a very helpful tool. Almost all processed foods are required by law to have this food label.

The information most valuable for someone with PWS is the serving size of the product, the calories and the grams of total fat.

• Calories are made up of carbohydrates, proteins, and fats. There are four calories per gram of carbohydrate, four calories per gram of protein and nine calories per gram of fat. Study food labels closely and review this website for more details and information about general nutrition:

www.cdc.gov/nutrition
http://www.cdc.gov/nutrition/everyone/basics

• **Carbohydrates:** This group is important for energy in the body, but there are some that are more nutritional than others that you should choose more often. The healthiest carbohydrates are fresh fruits and vegetables, whole-wheat products, brown rice, beans, peas, and lentils. Milk and yogurt are also sources of carbohydrates. Unhealthier carbohydrates are white bread, white pasta, white rice, muffins, donuts, cookies, brownies, and candy.

Read food labels closely and it's ideal to look for more than 3 grams of fiber per serving of healthier carbohydrate.

• **Protein:** Protein is important for building, maintaining, and replacing the tissues in the body. Your muscles, organs and immune system is made up of proteins and it is important to have good sources of protein in the diet. Protein comes from meat, chicken, turkey, fish, eggs, dairy, beans, nuts, and seeds. Each meal and snack should have a good source of protein to make for a balanced diet.

• **Fats:** Science and medicine have revised the recommendations as they relate to fat as part of a healthy diet. The recommendation also translates to people with Prader-Will syndrome. For many years fat was considered unhealthy and low-fat diets were recommended. New research has broken fats down into different components that require further explanation.

• **Monounsaturated/Unsaturated fats:** These fats have a beneficial effect on heart health when eaten in moderation and used to replace saturated fat and trans-fat in a diet. Omega-3, a type of monounsaturated fat, can lower triglyceride levels and increase HDL cholesterol (the good cholesterol). Several other studies also suggest that these fatty acids may help lower blood pressure.

• **Examples:** *Fatty fish like salmon, mackerel, herring, lake trout, sardines and albacore tuna are high in monounsaturated fats and the very good omega-3 fatty acids. The American Heart Association recommends eating these fatty fish at least two times a week. Eating a variety of these fish will help minimize any potential effects due to environmental pollutants. Omega-3 fats can also be found in flax seeds, walnuts, beef and soybeans. Canola oil, soybean oil, and olive oil also are good sources. While all of these foods are healthy, calories still count so offer these foods in proper portions.*

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• **Saturated Fats:** These fats are found naturally occurring in some foods that provide important nutrients for a healthy diet. So, the key here is to offer these foods in moderation and focus more on fats that are unsaturated as listed above.

• **Examples:** *fatty beef, lamb, pork, poultry with skin, lard, eggs, cream, butter, cheese, and other dairy products from whole/reduced fat milk.*

• **Trans Fatty Acids (Trans Fats):** Trans-fat needs to be reduced or eliminated whenever possible. These fats can raise blood cholesterol levels and contribute to heart disease. They provide very few nutrients and are high in calories.

• **Examples:** *Includes fried foods like doughnuts and baked goods including cakes, pie crusts, biscuits, frozen pizza, cookies, crackers, and stick margarines and other spreads.*

Figure 2 - Food Label

The serving size stated is what the caloric content is based upon. If you are serving 2 cups instead of 1 cup, you must double the calories and grams of fat.

Portion size is critical when using the label. The portion must be the same as the one stated on the label. If not, the difference must be recalculated. Servings Per Container is helpful as a buying guide and an aid in visualizing a serving size. The Nutrient List includes information for all the major nutrients.

The % Daily Value on the right side does not apply to PWS diets. These figures state how much of each nutrient this product contributes in a 2,000 calorie diet. However, if the percentages are high for fat, cholesterol, and sodium, it is generally not a good product for a PWS diet

Nutrition Facts

Serving Size 1 cup (228 g)
Servings per Container 2

Amount per serving

Calories 260 Calories from Fat 120

	% Daily Value*
Total Fat 13g	**20%**
Saturated Fat 5g	**25%**
Cholesterol 30mg	**10%**
Sodium 660mg	**28%**
Total Carbohydrate 31mg	**10%**
Dietary Fiber	**0%**
Sugars 36g	
Protein 5mg	

Vitamin A 4% • Vitamin C 2%

Calcium 15% • Iron 4%

*Percent Daily Values are based on a 2,000 calorie a day diet. Your daily may be higher or lower depending on your calorie needs.

Exchange System

The exchange system is a good diet plan because it is balanced, flexible, easy to follow and easy to modify as calorie needs change. Foods are divided into six groups based upon their calories and nutrients. They are starch/bread, vegetables, fruit, meat/protein, dairy products, and fat. Table 2 on this page, “Daily Food Plan Using the Exchange System,” shows the number of food choices, or “exchanges,” allowed from each group for a variety of calorie levels. Serving sizes are described in the “Food Exchange Lists” on pages 25-28. Foods in the correct portion size are selected each day according to the meal pattern. This meal pattern is the basis for planning daily menus.

When using the exchange system, it is still important to read food labels and compare them with the exchange list for portion size and calories. If the calories are significantly different, choose a different product or adjust the serving size. A daily food plan can be developed that is based on (Worksheet 3, page 19) nutrient needs and food preferences.

Table 2 should not be used for individuals who have diabetes. They need a meal plan based upon their nutrient needs and their insulin regimen. Consult a registered dietitian.

Table 2 - Daily Food Plan Using the Exchange System

	Calories per Day						
	600	800	1000	1200	1400	1600	1800
Exchange Groups	Number of Servings per day						
Starch/Bread	2	3	3	3	6	6	6
Vegetables	7	7	7	7	7	7	7
Fruit	3	4	4	4	4	4	4
Meat/protein	2	2	5	7	8	8	9
Dairy	1.5	2	2	2	2	2	3
Fat	1	1	1	1	1	2	3

**Fat should be used sparingly.*

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Juice, Soda, and Other Drinks

Fruit juice, soda, punch, and other sweet drinks will add many calories to the diet. These drinks contain “empty calories” because they provide few nutrients and many calories, and they are usually consumed in large amounts. Try drinking water or add a slice of lemon or a teaspoon of sugar-free drink mix to a glass of water. When drinking soda and other drinks, have only diet soda and drinks sweetened without sugar. Check product labels for the calorie content. One 12-ounce can of diet soda has zero calories compared with 140 calories in 12 ounces of regular soda. These artificially sweetened drinks will help to provide the sweet taste but will not add many calories.

Fiber

Foods high in fiber are important because they add bulk and may help an individual feel more satisfied. In addition, they help with regular bowel elimination. Foods such as vegetables, dry beans, whole grains, and fruit are low in fat and high in fiber. Include a large salad with a variety of vegetables with lunch and dinner. Top the salad with fat-free dressings, lemon juice or seasoned rice vinegar. Vegetables have very few calories and are the base of the modified Food Pyramid. Keep different vegetables washed and cut in the refrigerator to use as snacks. Fruit makes an excellent dessert. When using canned fruit, use fruit canned in its own juice or no sugar added.

Special Events

Treats and other high-calorie foods are a part of life. These foods, in very small amounts, may be planned into one’s diet. When a treat is included, adjust total calories by subtracting the calories from the daily total.

When incorporating treats or high-calorie foods, they must be planned ahead of time and included on your menus. Food is not to be used as a reward for good behavior. When given spontaneously, treats can be viewed as a reward. Unplanned treats can also cause increased anxiety surrounding food.

Special events and holidays are important for all families. Try to make food less important during holidays. Stress decorating, gift giving, and family togetherness.

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Determine what types of food will be served at your event. If limited options are going to be available, serve small meals at other points of the day and allow the individual to have a small portion of a few foods at the event. Depending on the event, packing a meal may be a good alternative.

If treats are limited to one time per month, 350 additional calories may be added. If offered more often, calories should be subtracted, or higher calorie items substituted for lower calorie ones.

Restaurant Eating Tips

Following are some suggestions for ordering meals when eating in a restaurant:

1. Look at the menu prior to going to the restaurant and plan what the individual will have beforehand. Menus are very tempting and should not be placed on the table or given to the diner.
2. Order small meals or lunch size portions. Avoid foods described as “large,” “colossal,” “supreme,” etc. The portion sizes are usually larger than are needed. Full dinners are usually less expensive than the “parts” in a la carte, but dinners usually provide more food than is needed. Also, it is very difficult for most people to leave food on the plate.
3. If a whole dinner is ordered, ask the server to box half of the meal in a to-go container before serving the meals to the table. Or try splitting a meal with a friend. Some restaurants will charge for the extra plate, but many will not.
4. Select foods that are baked, steamed, or broiled. Don’t be afraid to ask how the food is prepared and exactly what is served. Always ask for sauces, dressings, butter, etc. to be omitted. Ask for low calorie substitutes, e.g., sliced tomatoes, small green salad or fresh fruit, instead of french fries or other high-calorie foods.
5. Watch the cracker and breadbasket. It usually is served at the beginning of the meal when the diner is most hungry. Ask the server to remove the basket or ask the hostess when you arrive not to have a breadbasket delivered to the table.
6. Watch for “hidden” calories. Beware of sauces, especially cream and oil-based sauces in Italian restaurants. Avoid any food that is breaded and fried.
7. When ordering pizza, avoid high-fat toppings like sausage, pepperoni, olives, and extra cheese. Instead, order mushrooms, green peppers, or onions. Try Canadian bacon and pineapple pizza. Order a thin crust pizza rather than thick crust or deep-dish pizzas.

8. As soon as the meal is finished, ask to have your plate removed. It is very difficult to stop eating when there is still food on the table.
9. Don't order dessert. Usually, the servings are large and contain too many calories. If others are eating dessert, order fresh fruit. If dessert is ordered, split it with friends and order a smaller meal.

Nutrition Education

It is important that the person with PWS understand the basic principles of his/her diet as well as the benefits of weight control. The greater the understanding the individual has in the diet, the greater chance there is of better compliance. Generally, using visual aids for teaching is best.

Pictures of food or food groups included in the diet plan can be made or purchased. These pictures can correspond to the number of exchanges in the daily food plan or the number of servings from the PW Food Pyramid. As these foods are eaten throughout the day, the corresponding picture can be taken away. This allows the individual to see how much food he has left for the day. A similar system has been developed by The Children's Institute of Pittsburgh, PA using the Stoplight System for Weight Control.

Using the colors of the stoplight, foods are given a corresponding color: green for low calorie food, yellow for moderate calorie foods, and red for higher calorie foods. Meal guidelines are determined, and an individual can use the colors as a way of learning an appropriate meal pattern both at home and when eating out.

Exercise

A good exercise plan is very important for weight control. Some individuals with PWS need extra encouragement to participate in physical activity. Exercise improves coordination, muscle tone and strength, and increases muscle mass. Strenuous physical activity and/or competitive sports should be undertaken only with the approval of the doctor, but daily walks, bike riding, swimming and low-impact aerobics are activities in which most can participate. Approved exercise should be scheduled daily for 30-60 minutes duration minimum for most individuals with PWS without mobility impairments.

Exercise may help to make individuals with PWS feel better about themselves as well as helping them to be more physically fit. Regular exercise regimens can also increase the number of calories an individual can tolerate without gaining additional weight so that the diet is not as restrictive.

Eliminating Food Access

Many adolescents and adults with PWS have increased food access at school, supported living homes, and work environments. It is critical those opportunities for outside accesses to food are identified and strategies for limiting exposure are put in place so that calorie levels remain controlled and there is not a potential for gastric necrosis and rupture due to a food binge. Access to food can be a major detriment to any weight control plan for individuals with PWS.

Standard practices of locking cabinets and refrigerator doors and avoiding food being “left out” are important. Individuals should not be given money and should also be monitored when around vending machines or cafeterias if in a work or school environment. When access to food is strictly controlled, weight maintenance or loss is much more likely to occur.

Summary

This booklet has been written to assist caregivers and professionals in evaluating and planning the nutrition care for individuals with PWS. The booklet has attempted to be realistic and easy to follow. The worksheets, found after the resources section, are provided as step-by- step instructions for building a simple, yet sound, nutrition care plan.

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Resources

For young people in school, write nutrition goals into their Individual Education Plan (IEP). This will help to coordinate their family plan with the school plan.

State Agencies that serve the developmentally disabled will often fund nutritional assessments and education. Ask your case worker or service coordinator.

The American Diabetes Association
Exchange Guide for Weight Control
(800) 342-2383 • www.diabetes.org

Academy of Nutrition and Dietetics
Find a registered dietitian in your area.
(800) 877-1600 • www.eatright.org

The Children's Institute
The Red, Yellow, Green System for Weight Control
(412) 420-2159

Prader-Willi Syndrome Association | USA
(941) 312-0400 • www.pwsausa.org

Worksheet 1 – Finding Body Mass Index (BMI)

Fill in your weight and your height in the following boxes:

Weight (lbs.)	Height (inches)

Following is the formula for calculating BMI.* Fill in the spaces of the formula with your height and weight and complete steps 1-3 below. Use a calculator to figure the math.

Step 1

BMI = Weight in Pounds ÷ (Height in Inches × Height in Inches)
Sample: Weight 250 lbs, Height 5 feet (60")
250 lbs ÷ (60" × 60") = 250 lbs ÷ 3600" = .069

Step 2

Multiply Step 1 by 705
Sample: .069 × 705 = 48.64

Step 3

Circle the category in which your BMI falls on the chart below:

Underweight Severely *Acceptable* *Overweight*
Overweight *Morbidly Obese*

** Frances Sizer & Eleanor Whitney, Nutrition–Concepts & Controversies, (New York, 1994), p. 320.*

Table 3 - Guidelines for Goal Weights for Adults with PWS[1]

	Underweight	Acceptable	Overweight	Severely Overweight	Morbidly Obese
Men (2 BMI)	<20.7	20.7-27.8	>27.8	>31.1	>45.4
Women (BMI)	<19.1	19.1-27.3	>27.3	>32.3	>44.8
Health Hazard	Unlikely weight for an individual with PWS, may be associated with health problems	Attainable for some individuals with PWS; lowest health hazard	Attainable for most individu-als with PWS; has some health hazard	Increased disease risk	Weight reduction may be lifesaving

[2]BMI=Body Mass Index (weight (kg)/height(m)2
<=Less Than
>=Greater Than

[1]Carolyn J. Hoffman, MS, RD; Deborah Aultman, RD; Peggy Pipes, MPH, RD: A Nutrition Survey of and Recommendations for Individuals with Prader-Willi Syndrome Who Live in Group Homes. Copyright the American Dietetic Association. Reprinted by permission from JOURNAL OF AMERICAN DIETETIC ASSOCIATION, 1992;92:828

Worksheet 2 - Calculating Caloric Needs

Follow the steps below to estimate your daily calorie needs:

To maintain your weight, you will need approximately 30 calories per day for each inch of your height.

Your height in inches:

If you exercise most every day for about 30 minutes, multiply your height by 33.

_____ × 33 = _____
Height (inches) Calories every day to maintain weight

If you exercise sometimes, but not on most days, multiply height by 28.

_____ × 28 = _____
Height (inches) Calories every day to maintain weight

To lose weight, you must eat fewer calories, about 18-20 calories for each inch of height.

_____ × 19 = _____
Height (inches) Calories every day to lose weight

Worksheet 3 - Using the Exchange System and Your Daily Food Plan to Plan Your menu

1. Using the calorie level from Worksheet 2, (page 18) find the daily food plan that corresponds to your calorie need.

2. Write in the number of servings (exchanges) from each exchange group that can be eaten each day.

Your Calorie Level:	Veg.	Bread	Fruit	Milk	Meat	Fat

This shows how much food can be eaten every day. Remember to only eat the serving size listed in the exchange lists on pages 25-28.

3. The daily food plan can be converted to daily menus. Follow the example below which uses 1000 calories.

EXAMPLE	
Exchange List	Servings
Vegetables	7
Bread	3
Fruit	4
Milk	2
Meat	5
Fat	1

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Divide your day into three meals. Decide what exchange groups you want at each meal. Usually, people do not eat vegetables for breakfast. You may want to save your meat for lunch and dinner in order to have larger servings. Snacks can be made by using some of your exchanges from lunch and dinner and can vary in size, e.g., large meal with small or no snacks.

Example 1000 - Calorie Meal Plan

Exchanges	Breakfast	Lunch	Dinner
Vegetables	0	3	4
Bread	1	1	1
Fruit	1	1	1
Milk	1	1/2	1/2
Meat	1	2	2
Fat	0	1	1

Your Meal Plan: Your Calories Per Day _____

Exchanges	Breakfast	Lunch	Dinner
Vegetables			
Bread			
Fruit			
Milk			
Meat			
Fat			

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Now you're ready to plan menus based on your daily food plan. Menus for two days based on the 1000 calorie example are provided:

Menus Using the 1000 Calorie Food Plan

Exchanges	Breakfast - Day 1	Breakfast - Day 2
1 Bread	3/4 C Corn flakes	1/2 bagel with 1 teaspoon low sugar jam
1 Milk	1 C non-fat milk	1 C non-fat yogurt
1 Fruit	1/2 banana	1 small orange or 1/2 C juice
1 Protein	1 hardboiled egg	1 oz turkey sausage
0		
Exchanges	Lunch - Day 1	Lunch - Day 2
3 Vegetable	2 C raw veg. salad lemon of or fat free dressing	1 C raw veg. salad 1/2 C each lettuce & tomatoes (in taco)
1 Bread	1 slice whole wheat bread	soft taco - 1 corn tortilla
1 Fruit	2 peach halves (juice pack, rinsed)	1 C melon cubes
1/2 Milk	4 oz non-fat milk	4 oz non-ta milk
2 Meat	2 oz water pack tuna	1 oz lean ground beef, 1 oz low fat cheddar chhese
1 Fat	1 tablespoon fat free dressing, mayonnaise	non (already used in cheese)

Unused Exchanges from Lunch which may be used for Snack

1 Vegetable	1 C baby carrots	1 C cucumber slices with lemon

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Menus Using the 1000 Calorie Food Plan (Continued)

Exchanges	Dinner - Day 1	Dinner - Day 2
4 Vegetable	1/2 C steamed broccoli, 1/2 C steamed cauliflower, 2 C salad	2 C raw vegetable salad, 1 C steamed zucchini
2 Bread	1/2 C steamed rice	1 small baked potato
1 Fruit	1 tangerine	1 small peare
1/2 Milk	1/2 C non-fat milk	4 oz nonfat yogurt
2 Meat	2 oz broiled chicken breast	2 oz lean baked ham
1 Fat	1 tablespoon diet margarine	1 tablespoon diet margarine

Unused Exchanges from Lunch which may be used for Snack

1 Vegetable	1/2 C vegetable juice	1 C bell pepper strips
1 Bread	2 rice cakes	(None) No Snack

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Menus Using Your Calorie Level Food Plan

Circle Meal Being Planned: Breakfast Lunch Dinner	
Exchanges	Menu
Bread_____	
1 Fruit_____	
1/2 Milk _____	
2 Meat _____	
1 Fat _____	

Unused Exchanges from Lunch which may be used for Snack

Exchanges	Menu

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Menus Using Your Calorie Level Food Plan

Circle Meal Being Planned: Breakfast Lunch Dinner	
Exchanges	Menu
Bread_____	
Vegetable_____	
Fruit _____	
Milk _____	
Meat _____	

Unused Exchanges from ____ which are being used for Snack

Exchanges	Menu

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Food Exchange Lists

Starch/Bread (80 calories per serving)	Serving Size
Bread, Cereal & Pasta	
Cooked Cereals	½ cup
Ready-to-eat unsweetened cereal	¾ cup (1 oz)
Pasta (enriched or whole grain, cooked	½ cup
Rice (white or brown), cooked	1/3 cup
Quinoa, cooked	¼ cup
Couscous	½ cup
Granola	½ cup
Bagel	½ bagel
English Muffin	½ muffin
Hot Dog or Hamburger Bun	½ bun
Light Hot Dog or Hamburger Bun	1
Pita (6” across)	1
Tortilla (6” across)	1
Bread (white or wheat)	1 slice
Light/Diet Bread	2 slices
Dried Peas, Beans, Lentils	
Beans (cooked)	½ cup
Lentils (cooked)	1/3 cup
Starchy Vegetables	
Corn or peas	½ cup
Corn on the cob (6” long)	1
Baked Potatoe (small)	1 (3 oz)
Mashed Potatoes	½ cup
Winter Squash (acorn or butternut)	¾ cup
Yams or Sweet Potatoes	½ cup

Crackers/Snacks	Serving Size
Animal Crackers (plain)	8
Graham Crackers (2 1/2'' square)	3
Popcorn (no fat added)	3 cups
Pretzels (sticks)	40
Saltine-type crackers	6
Starchy Foods Prepared with Fat	
Pancake (4" across)	1
Waffle (4 1/2" across)	1
Taco Shell (6" across)	1
French Toast	1

Dairy Products (90 calories per serving) (Do not use whole or low fat milk)	Serving Size
Skim Milk	8 oz
Non-fat yogurt (check label for calories)	4-6 oz

Vegetables (25 calories per servings)	Serving Size
Cooked Vegetables Raw Vegetables Tomato/Vegetable juice	1 cup 1 cup ½ cup

Fat (45 calories, 5 grams of fat per servings)	Serving Size
Margarine/oil/mayonnaise Diet Margarine/diet mayonnaise Salad Dressing Reduced Calorie Salad Dressing Peanuts Seeds, Pine Nuts, Sunflower (without shells) Bacon Cream Cheese	1 teaspoon 2 teaspoons 1 tablespoon 2 tablespoons 20 small or 10 large 1 tablespoon 1 slice 1 tablespoon

Fruit (60 Calories per servings)	Serving Size
Fresh, Medium Fruit Berries or Melon Canned Fruit (in juice) Fruit Juice Dried Fruit Raisins	1 1 cup ½ cup ½ cup ¼ cup 2 tablespoons

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Meat and Meat Substitutes	Serving Size
Lean Meat (55 calories, 3 grams of fat per serving) Cooked poultry, without skin Cooked lean meat Cooked fish Tuna (in water) Non-fat cottage cheese Diet Cheese (less than 55 calories/oz) 95% Fat-Free luncheon meats	 1 oz 1 oz 1 oz 1 oz ¼ cup 1 oz 1 oz
Medium-Fat Meats and Substitutes (75 Calories, 5 grams of fat per serving) Most beef products Most pork products Skim or part-skim milk cheese: Ricotta Mozzarella Diet Cheese (56-80 calories/oz) Egg Tofu	 1 oz 1 oz ¼ cup 1 oz 1 oz 1 4 oz
High-Fat Meat and Substitutes (110 calories, 8 grams of fat per serving) Pork spareribs and sausage All fried fish products All regular cheese Luncheon meat- bologna, salami Turkey or Chicken hotdog Peanut Butter	 1 oz 1 oz 1 oz 1 oz 1 1 tablespoon

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