

Diabetes in Pregnancy



Overview



1. Gestational Diabetes
2. Risks and Goals of Treatment
3. Exercise, Diet, & Medication
4. Recommendations
5. Resources



Gestational Diabetes

What is it?

- Diabetes (high blood sugar) diagnosed during pregnancy

What impacts it?

- Hormones made by placenta cause the mother's insulin to not work as well: *insulin resistance*
- Blood sugar usually returns to normal after delivery of placenta

Potential Risk Factors

Race

Obesity

Age > 35

Sedentary Lifestyle

Family History of Diabetes

Previous Pregnancy with Diabetes

Previous child weighing greater than 9 lbs. or 4 kg. at birth

Physiology

Mother's high blood sugar brings extra glucose to the baby



Baby makes more insulin to handle the extra glucose



Extra glucose is stored as fat.
Baby can grow larger than normal

Possible Complications

RISKS FOR BABY	RISKS FOR MOM
Large Baby	Preeclampsia (High BP)
Hypoglycemia	Need for C-section
Birth Trauma (Shoulder Dystocia)	Development of Type 2 Diabetes later in life
Jaundice	Pre-term birth
Stillbirth	Frequent infections
Fetal Growth Restriction	

Positives



Reduced complications: Good blood sugar control reduces the frequency and severity of complications.



Data: Checking your blood sugars provides you with data and we can adjust interventions accordingly.

Treatment

Steps:

Blood
Sugar
Monitoring

Meal
Planning

Exercise

As needed: *Addition of medication*

- *Metformin*
- *Insulin*

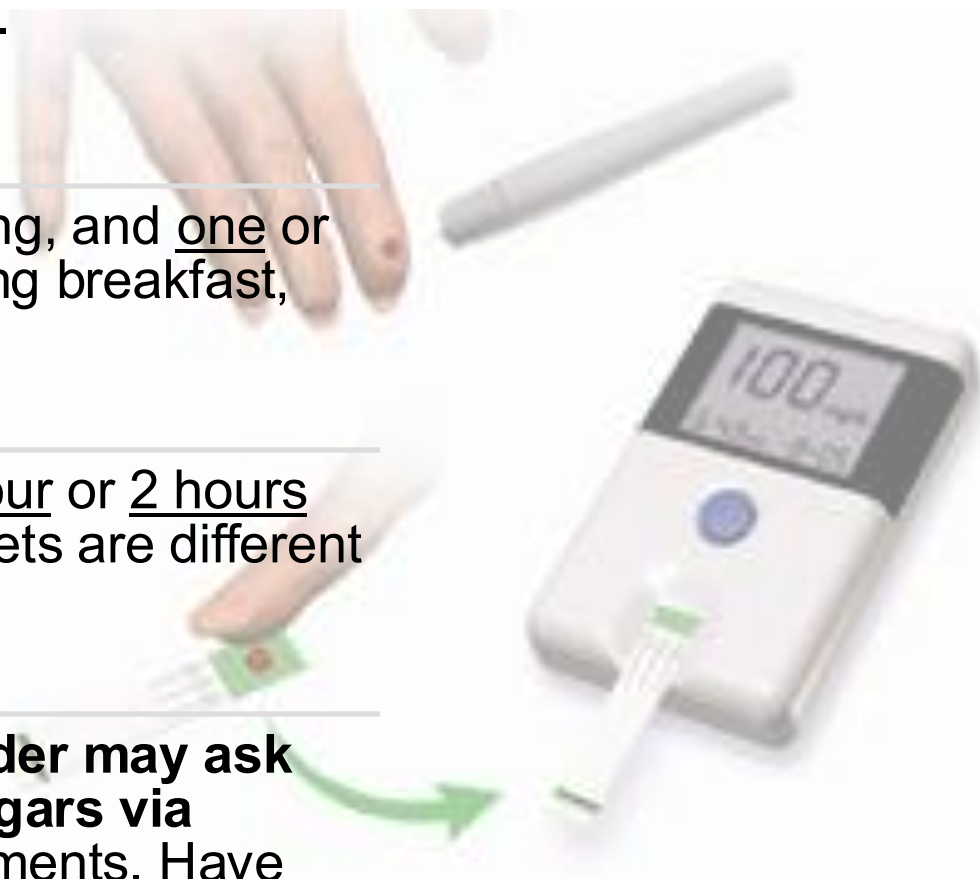
Monitoring your Blood Sugars

If using a blood glucose meter, check your blood sugar **four times daily**.

Check your blood sugar fasting, and one or two hours after you start eating breakfast, lunch, and dinner.

Be consistent with either 1 hour or 2 hours after meals. Blood sugar targets are different for each time period.

Your OBGYN or MFM provider may ask you to share your blood sugars via MyChart prior to our appointments. Have your blood sugars with you ready to review.



Blood Sugar Goals

<i>Time of Day</i>	<i>Blood Sugar Goal</i>
Fasting	60-95 mg/dL
1 hour after meals	70-140 mg/dL
2 hour after meals	70-120 mg/dL

Exercise Precautions

- Before starting any exercise routine, discuss safety or any other concerns with your medical provider.
- Precautions:
 - Preterm labor
 - Elevated blood pressure
 - Vaginal bleeding



Exercise

- Goal: 30 minutes of low to moderate-intensity exercise 5 days/week
- A 15-20 minute walk can potentially lower blood sugar by 20-40 mg/dL



Meal Planning: Goals

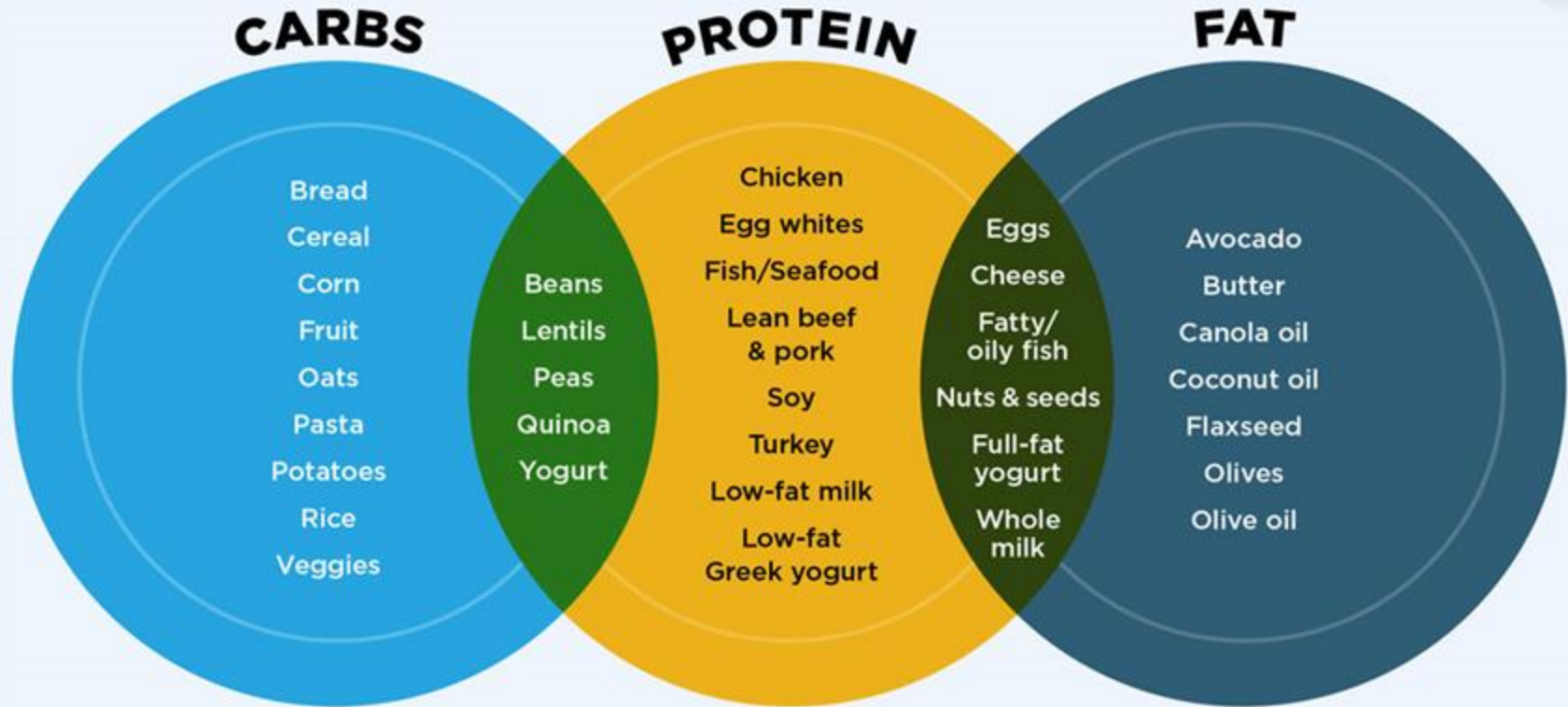


To achieve normal blood sugar levels

To provide adequate weight gain

To contribute to fetal growth and development

Food Groups



Understanding Carbohydrates

To best manage an increase in blood sugar, carbs. should be:

- **Consumed in small portions**
- **Spread throughout the day**
- **Always paired with a source of protein and fat**

MyPlate Guidelines

Steps to build a Plate/Snack:

1. Non-starchy vegetables:
1/2 of every plate you eat
2. Protein: **1/4** of your plate
3. High-fiber Carbohydrate:
1/4 of your plate you eat
4. Drink adequate amounts of water. Roughly 65 – 72 oz. per day.

Visual Guide



Meal Planning General Guidelines



Recommended to eat 3 meals, 3 snacks



Emphasize low-glycemic, nutrient dense carbohydrates



Avoid refined grains (found in packaged and processed items), simple sugars, fruit juices, candy, sweet treats, sweet liquids, cereal

Carbohydrate Counting

Carbohydrate counting is adding together the total grams of carbohydrates in the foods you eat.

Steps:

1. Learn which foods contain carbohydrates.
2. Read the nutrition label to determine the number of grams of carbohydrate in the serving size of the foods you are eating.
3. Add up the number of grams of carbohydrate from each serving of food you eat to get your total for your meal or snack.

Servings of Carbohydrates

1 serving of carbohydrate = ~15 grams

2 servings of carbohydrate = ~30 grams

3 servings of carbohydrate = ~45 grams

Food	Serving Size	Grams of Carbs
Whole wheat bread	1 slice	15 grams
Banana (fruit)	$\frac{1}{2}$	15 grams
Grapes (fruit)	17	15 grams
Peas, Corn, Potatoes	$\frac{1}{2}$ cup	15 grams
Milk	1 cup	15 grams
Brown Rice or Pasta	$\frac{1}{3}$ cup	15 grams

Carb. Counting Examples

1) 8 oz. cow's milk + $\frac{1}{2}$ banana = ?

2 servings of carbs or 30 grams

2) 4 oz. chicken salad prepared with
mayonnaise, sliced grapes, and walnuts + 8
whole grain crackers = ?

2 servings of carbs or 30 grams

3) 4 oz. beef roast + 1 C broccoli + 1 small baked
potato + small ear of corn = ?

3 servings of carbs or 45 grams

Reading Nutrition Labels

Gestational Diabetes:

- 175 grams carbs./day
- 2-3 meals with 30-45 grams of carbs
- 3 snacks with 15 grams

Nutrition Facts	
8 servings per container	
Serving size	2/3 cup (55g)
Amount per serving	
Calories	230
% Daily Value*	
Total Fat 8g	10%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	13%
Dietary Fiber 4g	14%
Total Sugars 12g	
Includes 10g Added Sugars	20%
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 240mg	6%
<small>* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.</small>	

Let's Read a Nutrition Label



SERVING SIZE

This will help you determine the right portion size and the total number of portions per package.



FATS

Replacing foods that are high in saturated fat with healthier options can lower blood cholesterol levels and improve lipid profiles.



CARBOHYDRATES

Carbohydrates (carbs) have the biggest impact on your blood sugar. Lower your carb count by eating a smaller portion size.

Nutrition Facts

8 servings per container

Serving size 2/3 cup (55g)

Amount per serving

Calories 230

% Daily Value*

Total Fat 8g 10%

Saturated Fat 1g 5%

Trans Fat 0g

Cholesterol 0mg 0%

Sodium 160mg 7%

Total Carbohydrate 37g 13%

Dietary Fiber 4g 14%

Total Sugars 12g

Includes 10g Added Sugars 20%

Protein 3g

Vitamin D 2mcg 10%

Calcium 260mg 20%

Iron 8mg 45%

Potassium 240mg 6%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.



CALORIES

Information in the label is based on a diet of 2,000 kcal per day. Calorie needs vary depending upon age, gender, activity level, and goals.



SODIUM

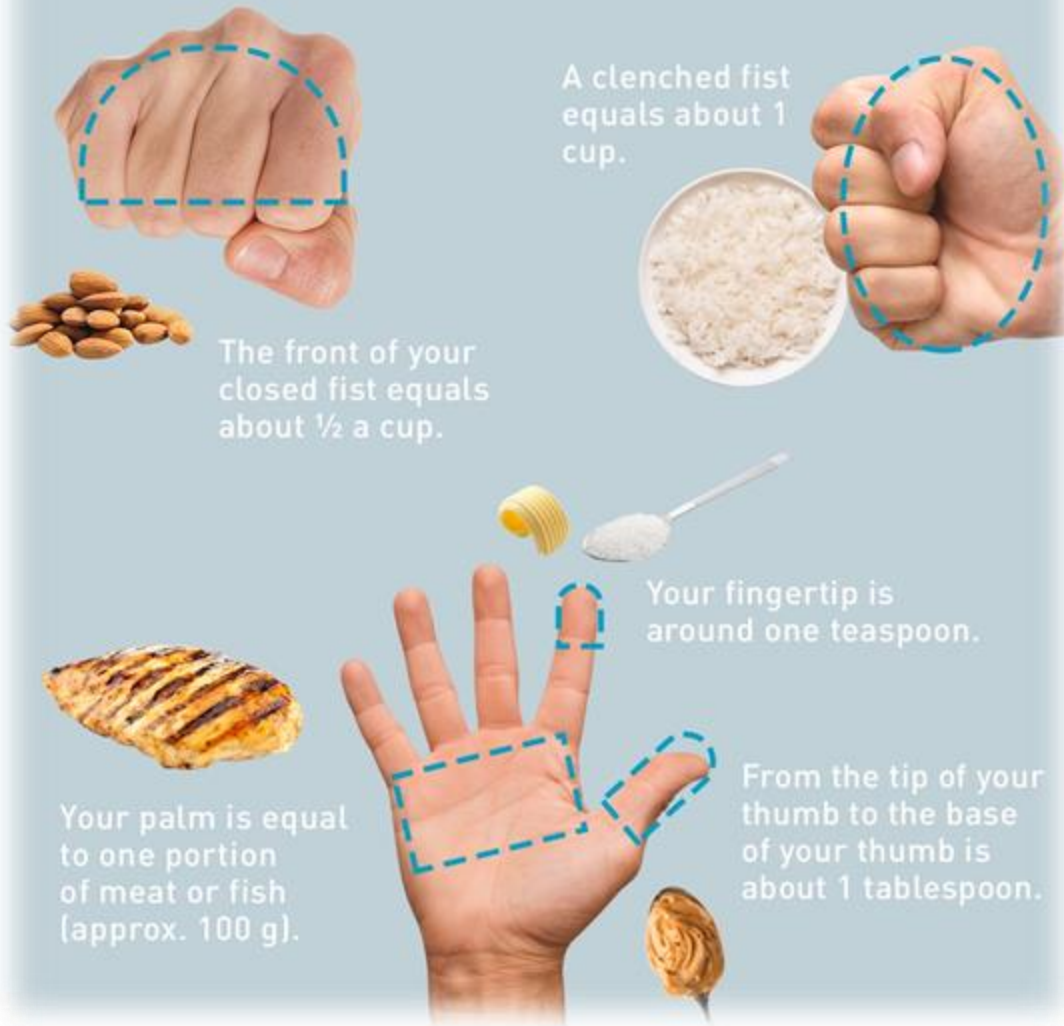
Eating less sodium reduces risk of heart attack, stroke, kidney disease, osteoporosis, stomach cancer and even headaches.



NUTRIENTS

Labels include nutrient measurements in milligrams. Check here to find recommended daily values.

ESTIMATE THE RIGHT PORTION SIZE

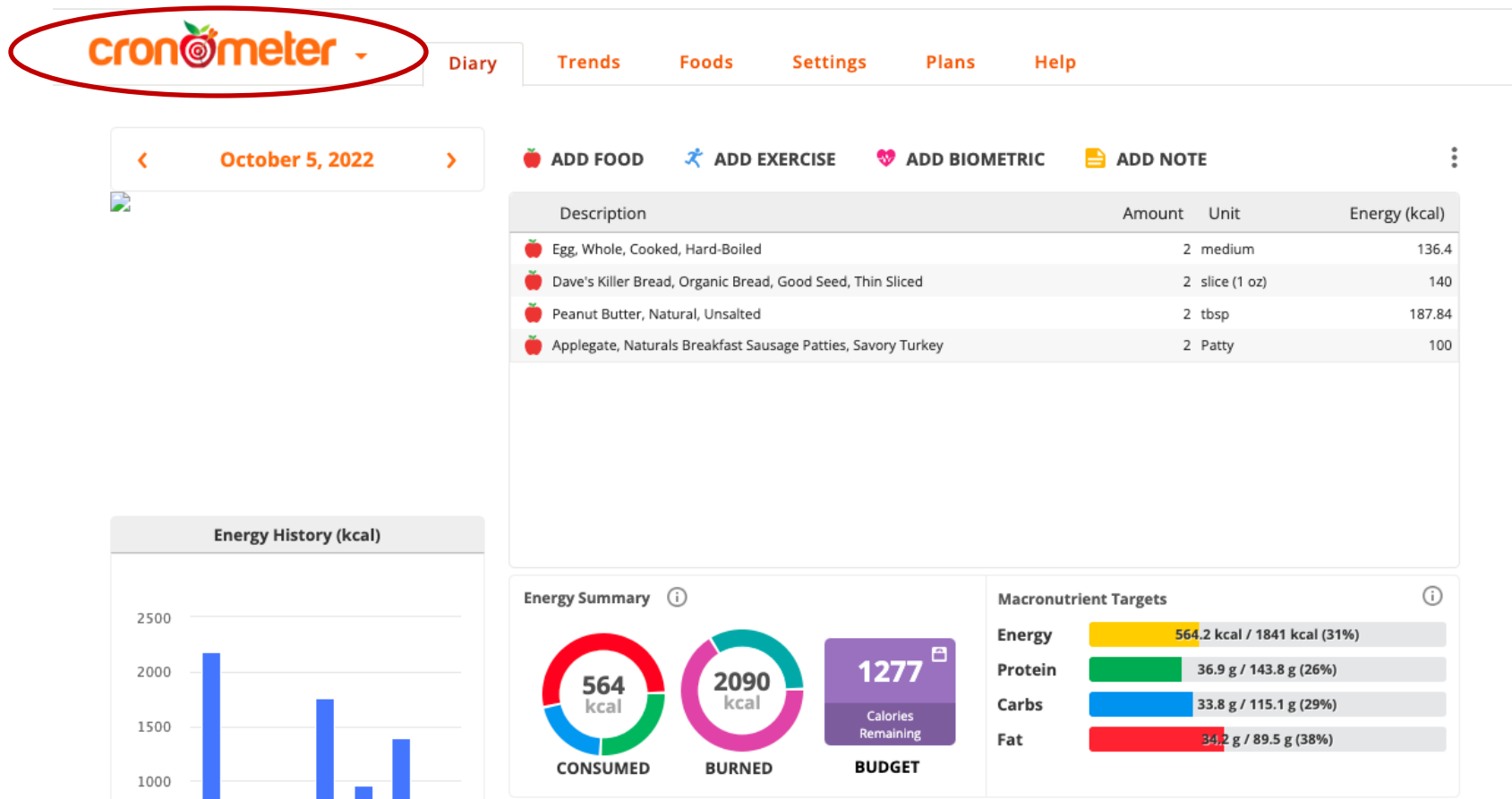


Estimating Portion Sizes

- Allows for flexibility when dining outside of home
- *Remember: Knowledge is power when making informed decisions about your intake*

Digital Applications

Make Counting Easy: Cronometer



Highlighted Nutrients



General			
Energy	564.2	kcal	31%
Alcohol	0.0	g	No Target
Caffeine	0.0	mg	No Target
Water	66.2	g	2%

Carbohydrates			
Carbs	33.8	g	29%
Fiber	8.7	g	35%
Starch	1.4	g	No Target
Sugars	6.6	g	No Target
Net Carbs	25.1	g	19%

Lipids			
Fat	34.2	g	38%
Monounsaturated	13.0	g	No Target
Polyunsaturated	6.4	g	No Target
Omega-3	0.1	g	6%

Vitamins			
B1 (Thiamine)	0.1	mg	10%
B2 (Riboflavin)	0.5	mg	47%
B3 (Niacin)	4.7	mg	33%
B5 (Pantothenic Acid)	1.6	mg	31%
B6 (Pyridoxine)	0.3	mg	20%
B12 (Cobalamin)	1.0	µg	41%
Folate	69.8	µg	17%
Vitamin C	0.0	mg	0%
Vitamin D	76.6	IU	13%
Vitamin E	2.5	mg	17%
Vitamin K	0.3	µg	0%

Minerals			
Calcium	62.6	mg	6%
Copper	0.1	mg	16%
Iodine	45.5	µg	30%
Iron	3.7	mg	20%

Digital Applications (cont.)

Hidden Sources of Carbohydrates

- Low-fat foods
- Salad dressings
- Sauces such as BBQ, gravy (made with flour), tomato
- Condiments such as Ketchup
- Peanut Butter
- Yogurt
- Fried foods
- Milk alternatives such as oat milk
- Protein or granola bars
- Liquid in canned or jarred foods (many contain high fructose corn syrup or other sweeteners)

Whole Foods-Based Sample Meal Plan

- Breakfast: Vegetable omelet/egg cups, no-sugar breakfast sausage, whole-grain toast with butter
- Morning Snack: Apple and peanut butter
- Lunch: Chicken soup with vegetables and beans, salad with oil-based salad dressing, avocado, and/or cheese
- Afternoon Snack: Cheese, turkey, and whole grain cracker stacks
- Dinner: Beef roast, roasted broccoli, baked sweet potato, orange
- Dessert: Berries, square of dark chocolate, nuts
- Evening Snack: Greek yogurt with seeds or nuts; vegetables with hummus or guacamole

Sample Meal Plan

Carb. Totals & Nutritional Benefits

- Breakfast: Vegetable omelet/egg cups, no-sugar breakfast sausage, whole-grain toast with butter
 - 15 – 30 g of carb. depending on 1-2 pieces of toast + nutrients choline & glycine
- Morning Snack: Apple and peanut butter
 - 15 g of carb. in small apple + fiber and vitamin C
- Lunch: Chicken soup with vegetables and beans, salad with oil-based salad dressing, avocado, and/or cheese
 - 35-45 g of carb. in 1 C of beans (depending on type) + nutrients and vitamins glycine, folate, vitamin K

Sample Meal Plan

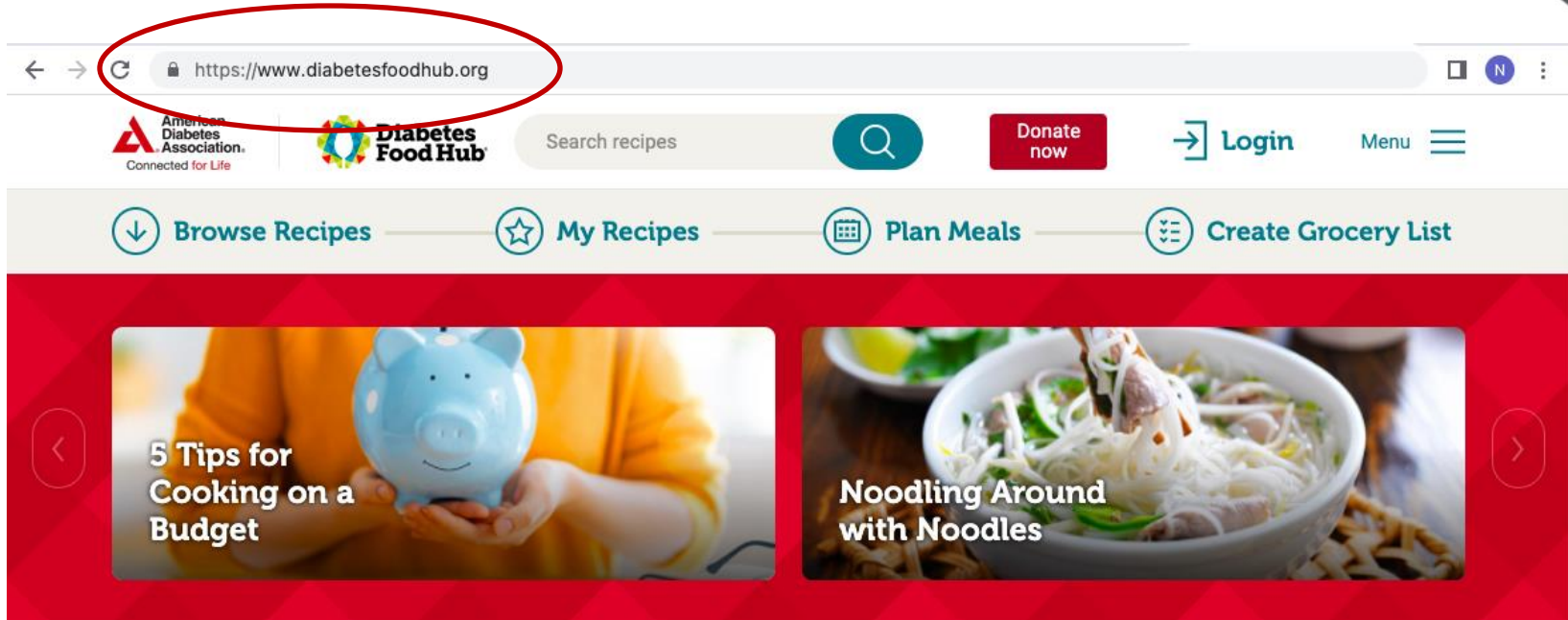
Carb. Totals & Nutritional Benefits

- Afternoon Snack: Cheese, turkey, and whole grain cracker stacks
 - 15 g of carb. in 6 whole grain crackers + nutrients and vitamins such as calcium, vitamin B, iron, selenium
- Dinner: Beef roast, broccoli, baked sweet potato, 1 orange
 - 30 g of carb. in sweet potato and orange + nutrients and vitamins such as iron, retinol, folate, B6 and B12
- Dessert: Berries, square of dark chocolate, nuts
 - -20 g of carb in 1 $\frac{1}{4}$ C berries and 1 square of dark chocolate
- Evening Snack: Greek yogurt with seeds or nuts; vegetables with hummus or guacamole
 - 15 g of carb in 1 C in Greek yogurt + nutrients such as calcium, probiotics, vitamin K₂

Things to Consider:

- Dietary preferences
- Cultural foods
- Rethinking meals
 - Sometimes typical “lunch” or “dinner” foods are easier to construct for breakfast and vice versa
 - Snacks can be a half portion of a prior meal
 - Less rigidity to reduce stress around eating

www.diabetesfoodhub.org



The screenshot shows the Diabetes Food Hub website. The browser address bar at the top displays the URL <https://www.diabetesfoodhub.org>, which is circled in red. Below the address bar, the website header includes the American Diabetes Association logo (Connected for Life), the Diabetes Food Hub logo, a search bar with the text "Search recipes", a "Donate now" button, a "Login" button, and a "Menu" icon. A navigation bar below the header contains four links: "Browse Recipes", "My Recipes", "Plan Meals", and "Create Grocery List", each with a corresponding icon. The main content area features two large featured articles: "5 Tips for Cooking on a Budget" (with a piggy bank image) and "Noodling Around with Noodles" (with a bowl of noodles image). Navigation arrows are visible on the sides of these articles.

Featured Recipes >



Medications

- If blood sugars are resistant to diet and exercise, medication will be recommended.
- Choices include:
 - a. Metformin (an oral pill)
 - b. Insulin (an injection)

Other Recommendations



Monitoring the Baby

- 3rd trimester :
 - Growth ultrasounds
 - Monitoring the Baby
 - NST's (non-stress tests)
 - Biophysical Profiles (BPP's)
- Timing of Delivery
 - 37-40 weeks (depending on glucose control)

Prevention of Type 2 Diabetes

Having Gestational Diabetes increases your risk of developing Type 2 diabetes later in life.

Two recommendations to decrease this risk are:

- Breastfeeding
- Lifestyle Modification
 - Diet
 - Exercise
 - Weight management



Additional Resources

1. American Diabetes Association - <https://diabetes.org/diabetes/gestational-diabetes>
2. Free Mobile Phone Apps for nutritional information - Cronometer, MyFitness Pal
3. WakeMed Diabetes in Pregnancy Resource Center – 919-350-4589
4. Recipes and Meal Planning - <https://www.diabetesfoodhub.org/>
5. WakeMed Voices Podcast - <http://files.radiomd.com/archives/wake-med/wkmo2o.mp3>



References

- Volume 45 Issue Supplement_1 | Diabetes Care | American Diabetes Association (diabetesjournals.org)
- Practice Bulletin | ACOG
- American Diabetes Association | Research, Education, Advocacy
- Academy of Nutrition and Dietetics Gestational Diabetes Evidence-Based Nutrition Practice Guideline - PubMed (nih.gov)
- Effect of Dietary Intervention Designed with Behavior Change Wheel on Compliance with Dietary Control in Women with Gestational Diabetes Mellitus: Study Protocol for a Randomized Controlled Trial - PubMed (nih.gov)
- HPRC – The military's source for fitness, wellness, and performance nutrition (hprc-online.org)