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## **Blender Bikes: Blending Nutrition and Physical Activity**

### **Abstract**

Many Americans do not meet the recommendations for diet and physical activity. A blender bike can be an effective tool when coupled with hands-on activities that reinforce health recommendations. We created *Blending Nutrition and Physical Activity: An Activity Guide for Use with Blender Bikes* to use when incorporating a blender bike into educational sessions held in classrooms and at afterschool programs, camps, fairs, and other venues. We provide a research-based rationale for implementing blender bike demonstrations and describe activities in the guide that take blender bike use beyond a fun, eye-catching display to experiences that convey nutrition and physical activity concepts and help achieve Extension's health-related goals.

**Keywords:** [blender bike](#), [4-H Healthy Living](#), [nutrition](#), [physical activity](#), [hands-on activities](#)

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## **Introduction**

Although the *Dietary Guidelines* (U.S. Department of Health and Human Services [HHS] & U.S. Department of Agriculture [USDA], 2015) recommend eating more fruits and vegetables, consuming fat-free or low-fat dairy products, and limiting calories from added sugar, many Americans do not apply these guidelines (Centers for Disease Control and Prevention [CDC], 2010, 2013; Kimmons, Gillespie, Seymour, Serdula, & Blanck, 2009; Moore & Thompson, 2015). Middle-school-aged and high-school-aged children are especially lacking with regard to fruit and vegetable consumption (Guenther, Dodd, Reedy, & Krebs-Smith, 2006). Additionally, research has indicated that sugar-sweetened beverages are the single largest source of added sugars in adolescents' diets (Scharf & DeBoer, 2016) and that adolescents consume two to three times the recommended limit for added sugars (Ervin, Kit, Carroll, & Ogden, 2012). Moreover, many children and adolescents do not get the recommended amount of daily physical activity (CDC, 2014; HHS, 2008).

Approaches to addressing the aforementioned issues can include providing hands-on educational activities. Research has shown that hands-on food experiences, taste testing, and cooking classes are fun and enjoyable for young people (Cirignano et al., 2013; Young, Ramsay, & Holyoke, 2016) and that they are effective teaching strategies (Dudley, Cotton, & Peralta, 2015; Nelson, Corbin, & Nichols-Richardson, 2013; Walters & Stacey, 2009). As well, such hands-on, experiential activities can translate to interest in making foods at home, which in turn may help young people meet dietary recommendations (Larson, Perry, Story, & Neumark-Sztainer, 2006).

A blender bike, which is a bike with an attached blender powered entirely by its rider, can be an effective tool for

creatively conveying nutrition and physical activity concepts. We created *Blending Nutrition and Physical Activity: An Activity Guide for Use with Blender Bikes* to fill the void in structured blender bike learning activities and research-based information for instructors.

## Our Blender Bike Experience

Featuring a blender bike at events can attract attendees and thereby provide an opportunity to disseminate health-related information to more people. However, although pedaling a blender bike is appealing and fun, it is usually a short-lived experience. We believed that with complementary learning activities, the blender bike would be a vehicle for more in-depth engagement. The activity guide we created describes experiential learning activities that involve riding the bike, customizing recipes, making and sampling foods, and considering ways to adopt healthful dietary and physical activity recommendations.

Using grant funding, we purchased a blender bike customized with a large 4-H emblem (see Figure 1). Our bike is housed at the state 4-H office. We have used the bike in three ways: (a) in our own educational programming, (b) in response to requests to bring the bike to events and lead activities, and (c) for loaning to other Extension professionals. Educational sessions targeting children, teens, and adults held in classrooms and at afterschool programs, camps, fairs, and corporate events have been well received.

### Figure 1.

Blender Bike in Action at the Ohio Capitol



## Activity Guide Contents

The activity guide contains five activities and accompanying supplemental information.

### Activities

Three activities involve food preparation and taste testing. The guide begins with an activity for making fruit smoothies as they are familiar to many people and have been found to aid in increasing fruit consumption (Bates & Price, 2015). The other two activities involve making a smoothie by customizing a standard recipe and taste testing salsa and hummus blended on the bike. These three activities are appropriate for a one-wheeled stationary blender bike with a front-mounted blender and a standard bike retrofitted with a blender attachment that sits over the back wheel. During demonstrations, we emphasize that the recipes can be replicated easily at home with a regular blender.

Two activities teach important physical activity concepts but do not directly involve the bike. A short time pedaling a blender bike is not enough to meet the requirement of 60 min of daily physical activity, but these

activities open discussions about the intensity of various activities, the benefits of physical activity, creative ways to include physical activity each day, and the relationship between calories consumed and energy expended. These activities also engage participants while they are waiting for a turn to pedal.

Table 1 contains a description of the activities included in the guide.

**Table 1.**  
Summary of Blender Bike Activities

<b>Activity</b>	<b>Description</b>
Using a Blender Bike to Make Smoothies in a Teaching Setting	Participants learn about smoothie ingredients and get hands-on experience pedaling a blender bike to make a smoothie. The instructions also help the facilitator make the most of the time available by suggesting ways to incorporate three learning activities, including making smoothies, into one session.
Create Your Own Smoothie Recipe	Participants learn the rationale for including certain types of ingredients in a smoothie. Then, using large cards with images of ingredients, they work together to create and display their group's own version of a standard smoothie recipe.
Beyond Smoothies	To maximize taste testing within the available time, the instructions guide the facilitator to set up stations for three different recipes (smoothies, hummus, and salsa). Participants get hands-on blending experience within a 45-min session.
The Beat Goes On	Physical activity guidelines promote moderate to vigorous physical activity. Participants learn how to take a pulse and experience how different intensities of physical activity affect heart rate.
Calories In, Calories Out	Participants try to correctly sort food and beverage cards into one of three activity categories based on how long they would have to pedal a bike to burn off those calories. The goal is for

participants to make the connection between food consumed and energy expended through physical activity. It is not just about the calories—the activity introduces the concept of nutrient density, that is, the nutrients provided relative to the amount of calories.

Throughout the guide, we included research-based information and emphasized dietary and physical activity recommendations (HHS, 2008; HHS & USDA, 2015). Table 2 illustrates how health recommendations associated with the blender bike activities are aligned with these recommendations.

**Table 2.**

Health Recommendations Promoted in the Blender Bike Activity Guide

<b>Health recommendation</b>	<b>How blender bike activities fit with message</b>
1. Eat a variety of healthful foods each day.	Blender bike recipes feature a variety of the foods most people need to eat more of—fruits and vegetables, low-fat dairy products, fiber, and plant-based protein.
2. Consume a balanced diet that matches food intake to the number of calories needed.	The blender bike reminds users that physical activity is fun and good for them. Regular physical activity helps people balance their calorie intake with energy expenditure, which can help them stay fit and avoid excess weight.
3. Make healthful food choices by selecting foods that have little or no added sugar and fat.	Smoothies and other blender bike recipes can be made with ingredients that contain little or no fat and little or no added sugar. The fruits and fruit juice provide natural sugars with plenty of sweetness.
4. Eat more fruits and vegetables.	Fruits are the foundation of smoothies. Vegetables such as fresh spinach can be added to smoothies too. Other blender recipes feature vegetables, such as those for salsa and pumpkin hummus.
5. Eat more whole grains.	Whole-grain crackers or tortilla chips accompany blender bike recipes for salsa and hummus.
6. Drink more water.	Smoothies contain water in the form of ice. Water is important for remaining hydrated, especially during physical activity.
7. Eat less junk food, including fewer sugar-sweetened beverages.	Smoothies do contain calories, but they are a more healthful choice. Compared to sodas, sweet teas, and flavored coffee drinks, smoothies contain far more vitamins, minerals, and fiber (i.e., they are nutrient dense).

8. Increase physical activity.

Pedaling the blender bike draws attention to the importance of being physically active. The goal is for children to get 60 min of moderate to vigorous physical activity a day.

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## Supplemental Materials

The supplemental materials included in the guide are designed to provide background information and help instructors use the blender bike and lead the activities with ease. These materials include

- blender bike description,
- fact sheets,
- recipes,
- troubleshooting guide,
- game materials,
- supply list,
- sample report form,
- references, and
- information on logistical considerations (e.g., funding, storage, transportation, loan procedures, and event management).

## Blender Bike Impacts

To track usage of the bike, we ask users to complete a brief report form. Between January 2016 and November 2017, it was used at 67 events, reaching more than 5,500 people. Teen leaders can easily use the bike; in fact, one teen leader produced 300 smoothie samples at a festival. Additionally, several counties have gone on to purchase their own blender bikes.

Blender bike sessions receive consistently high ratings. For example, after one camp session, a parent commented, "I am so glad you were able to incorporate healthy living into camp! My daughter is excited to try making smoothies at home. We bought the ingredients today at the store to make them in the morning!"

Although not our primary goal, the blender bike has helped increase visibility for Extension's health-related programs as well. For example, it was featured in our state's annual report, in statewide media releases, and at a legislative luncheon.

## Conclusion

There are many factors influencing diet and physical activity (Fitzgerald & Saccarotella, 2009). A blender bike is a creative and engaging tool for educating audiences about healthful eating, the importance of fruit and vegetable

consumption, limiting sugar-sweetened beverages, and physical activity. The blender bike does not stand alone; it should be viewed as a tool to aid in achieving health-related program goals. With associated learning activities such as those described here, the blender bike can be a vehicle for conveying nutrition and physical activity concepts.

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