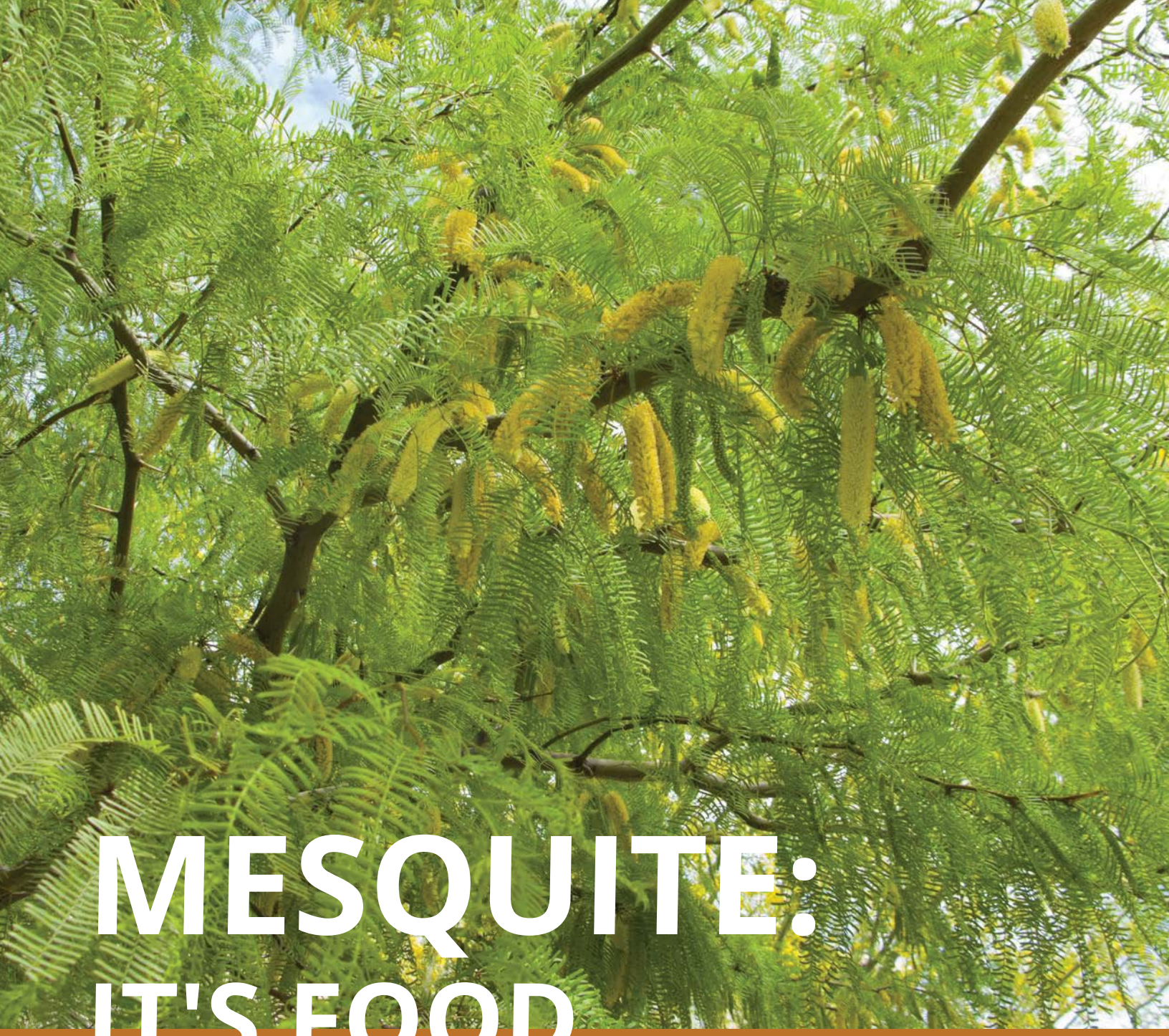

MESQUITE: IT'S FOOD

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What is Mesquite?

People living in areas containing mesquite (pronounced me-skeet or mes-keet) trees, including many parts of Arizona, may be familiar with their aesthetic appeal or the utility of mesquite's dense and aromatic wood for barbeques or furniture, but it is not as commonly known that parts of mesquite trees are edible. Mesquite is found in arid and semi-arid areas of North America, South America, Asia, and Africa. There are a total of forty-four varieties of mesquite throughout the world. [1] Mesquite trees extend from northern Mexico all the way through southern California, Arizona, southwestern Utah, New Mexico, Texas, and even up into the southwestern portions of Kansas.

The mesquite tree is a member of the legume family of plants. In Arizona, there are three types of mesquite tree varieties: the honey mesquite *(Prosopis glandulosa)*,screwbean mesquite *(Prosopis pubescens)*, and velvet mesquite *(Prosopis velutina)*. Trees can grow 20-30 feet in height with trunks up to two feet thick. Mesquite leaves are bipinnately compound (a leaf is divided twice: each leaflet is subdivided into smaller leaflets), typically 3-5 inches long, narrow, and dark to dusk green with a gray and hairy surface. Flowers are yellow-green and about 2-3 inches long. Seedpods are straight or slightly curved (resemble peapods), flat, about 3-8 inches long, and can be found hanging individually or in drooping clusters. Seedpods mature in early summer. [2]

You can substitute mesquite flour for other flour in any recipe, which will add great flavor and fiber. Some recipes are included below.

Apple Cranberry Mesquite Bread or Muffins

Ingredients:

1/2 cup whole wheat flour
1/2 cup mesquite flour
1/2 cup vital wheat gluten
1 Tbsp. sugar
2 tsp baking powder
1/2 tsp. salt
1/2 cup apple, fresh, diced
1/2 cup cranberries dried
1 tsp. cinnamon
1 Egg, large
1/2 cup milk
1/4 cup oil

Directions:

Spray small loaf pan or muffin tin with nonstick coating. Preheat oven to 350°F (325°F if using convection oven). Sift together flour, sugar, baking powder and salt into mixing bowl then add the fruit. In a separate bowl, beat the egg slightly. Add milk and oil, beat to blend. Make a well in dry ingredients, pour in all the liquid and blend until all the dry ingredients are moistened and batter is fairly smooth. Pour dough into loaf pan. Bake until toothpick inserted near center comes out clean, about 45-55 minutes or spoon into muffin tins and bake for 20-25 minutes. Makes 1 loaf or 12 muffins.

Nutrient facts per muffin:

Calories: 131, Protein: 7g, Fat: 5g, Carbohydrates: 15g, Fiber: 3g (prepared using 1% low fat milk and canola oil; using different ingredients can change the nutrient composition)

Estimated cost to make: ~$7

*Mesquite Pan Bread**

Ingredients:

1 cup whole wheat flour
1 cup mesquite flour
1 cup water
Cooking oil for the frying pan

Directions:

Combine the flour and meal in a bowl. Add enough water to make dough. Heat a thin layer of oil in a frying pan or skillet. From the dough, make small flat patties (about 3 to 4 inches across), and place them in the skillet. When the patties are browned (about 2 minutes per side) turn them over. Serve with butter or honey, if desired. Makes about 15 3-4 inch patties.

Nutrients facts per bread patty:

Calories: 61, Protein: 2g, Fat: 0.5g, Carbohydrates: 14g, Fiber: 4g

Estimated cost to make: ~$2

*Citation: Cannon, Carrie Calisay, Sioux, Kiowa, and Sioux, Oglala.

Making your own mesquite flour

If you live in an area with mesquite trees, you can make your own mesquite flour. It can be a fun, family activity that includes physical activity! And it can be a great addition to home gardening. In the following section, we provide the best practice guide for harvesting, sorting, drying, storing and milling the mesquite pods.

Mesquite flour- Collecting and harvesting bean pods from mesquite trees, grinding, and milling into flour have been practiced for many years. Native American groups in the Sonoran Desert have used mesquite as a winter food or replacement for other crops that did not produce as much. Mesquite has also been made into juice and fermented to make alcoholic beverages by the Native groups that harvested the pods. [3]

Mesquite flour that was one of important staple foods for native people is now a new versatile ingredient for both native and non-native people. Today, some restaurants are using mesquite flour for making tortillas, breads, pancakes and muffins. You can purchase mesquite flour (mesquite meal, as it is sometime called) at specialty stores, farmers markets, or online at the average price $15 per pound. (Price range, $11 to $22 per pound - July 2014)

According to nutrition facts labels on various mesquite products, two tablespoons of mesquite flour provides 2 g of protein, 14 g of total carbohydrate, 1 g of fat, and 6 g of fiber. Compared to other types of flours, mesquite flour provides higher nutrient contents (see Table below). The mesquite flour provides slow digesting, sustainable energy.

What are Aflatoxins?

Aflatoxins are naturally occurring toxic chemicals produced by mold contamination that typically affect corn, certain nuts including peanuts, and wheat. Aflatoxins are known carcinogens and have been associated with various diseases. Consumption of aflatoxin-contaminated products poses a health concern to both humans and animals. In the US, aflatoxins pose a low-level threat because of regulations and testing by federal agencies and food production industries excluding contaminated products from the food supply. [5]

Here are management practices that can help you minimize aflatoxin problems:

- Do not collect any pods from the ground for milling. Pods in contact with the soil have a greater likelihood of coming into contact with fungi that causes aflatoxin contamination.
- Examine mesquite pods. Discard pods with insect damage – holes.
- Dry mesquite pods (less than 10% total weight) and store in clean, airtight containers.
- Mill the pods after monsoon season has ended.
- Protect flour from insects.
- Store flour in cool and dry conditions.

If you would like to check whether your mesquite flour is contaminated with afl toxin or not, contact Sadhana Ravishankar, Ph.D., School of Animal and Comparative Biomedical Sciences. (Email: sadhravi@email.arizona.edu)

Harvesting

- In Arizona, mesquite pods generally ripen in June to late July.
- Harvest pods early in the season, before the summer monsoon season is fully active. Mesquite can also be harvested after the summer rains. Mid to late June is the best time to pick pods.
- Look for pods that are tan to red in color or tan with red spots. These are ripe. Do not pick pods with green on them because they are not ripe yet.
- Pick a pod and snap it in half; you should hear it snap. Once snapped in half, you may taste the pod by licking it or chewing on it lightly. If it tastes sweet, pick them.
- Harvest pods when they are brittle and when the seeds rattle inside the pod when you shake it. They will come off the tree easily.
- Do not harvest pods that are on the ground, as they may be contaminated with bacteria or fungus, which may produce aflatoxin (see right column).
- Do not pick pods with large holes or black spots (fungus) on them.

Sorting

Before drying, look through the pods and remove stems, leaves, and other debris.

Drying

There are three ways to dry mesquite pods. Regardless of the method used, you will know the pods are dry enough when they snap loud enough so you can hear it. The three methods for drying pods are:

1. Place the pods on a dry surface and set them out in the sun to dry till the pods are entirely dry. (Check the weight before and after drying or snapping them in half to hear the sound.) This works before the monsoon/rainy season begins.
2. Place the pods on a tray and put them in a solar oven that is 200°F inside. Heat for 1-2 hours. Once again, this works well on sunny days.
3. Place pods on a cookie tray in an oven at 200°F for 1-2 hours. Be careful not to burn them. They turn brown when burnt.

Storing

Pods can be stored in several ways.

- Clean and dry buckets that have lids. Beetles may appear once the storage period is over. These beetles are not harmful. Drying methods 2 and 3 should kill the eggs that the beetles hatch from.
- Pods can also be stored in freezer bags inside the freezer. When the pods are thawed there is condensation that moistens the pods, and they must be dried before milling.

Milling

- Pods can be taken to a milling event to be turned into flour. For example, there are three organizations that hold milling events in southern Arizona: Desert Harvesters, the Tucson Audubon Society, and Baja Arizona Sustainable Agriculture (BASA). These organizations charge a nominal fee, usually per pound, to grind the pods into flour.
- They will inspect the pods brought to these events to ensure there is no debris that could break the mill and that the pods are dry enough to mill.
- If pods are not dry enough, the organizations will not grind them because the pods will gum-up the mill, making it difficult to clean.
- It is not recommended to try making flour in a home blender or food processor. Mesquite pods can be tough and the consistency of the flour is such that it can gum-up your blender or food processor. It could even break a blender or food processor.

References

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4. USDA, SuperTracker – Food-A-Pedia 5. Allen Wrather et al. Aflatoxins in Corn. University of Missouri, Extension. G4155 (2010)