

# Dream Job: Food chemist

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Uma Parasar is a senior research fellow with the research and development flavors team at International Flavors and Fragrances, Inc (IFF). She helps make sure the flavors her company makes are safe to eat and drink. Photo: Uma Parasar

Do you ever wonder what makes some packaged foods and drinks taste great? Well, a chemist such as Uma Parasar might be the one to thank. Parasar is a senior research fellow with the research and development flavors team at International Flavors and Fragrances, Inc (IFF). You can taste flavors her lab has created in all kinds of things — juices, yogurts, candy, potato chips and chocolate. Specifically, as a toxicologist, Parasar is responsible for making sure the flavors her company makes are safe to eat and drink.

## **Question: Why do you like chemistry?**

**Answer:** We humans are made up of chemicals and so is the natural world, as well as the materials-based world. Embracing chemistry helps us appreciate our amazing world and not fear it. I wanted to be a chemist to solve problems. My specialty, toxicology, helps create a safe world. Arguably, toxicology is the oldest scientific discipline, as the earliest humans had to recognize which plants were safe to eat.

## **Q: Do you have any favorite food chemicals?**

A: Yes, vanillin. It's the chemical responsible for the scent in vanilla — and one of the most widely used flavor in foods, including ice cream and cookies.

**Q: How do chemists create flavors in a lab?**

A: We use special equipment to trap odors to learn which chemical is responsible for which smell. Remember, taste is 90 percent smell. Then we recreate that smell by mixing the molecules of that chemical in a bottle. I am working on meat-free protein alternatives right now. We can create something that mimics the taste of meat using non-meat ingredients.

**Q: What are some other favorite projects you've worked on?**

A: I've worked on a plant extract that makes your mouth tingle and another that makes everything you taste after, even a sour lemon, taste sweet. Also, I've worked on alternative dairy products — especially interesting to me because I'm lactose intolerant. I've worked on soy milk to mask its harsh aftertaste.

**Q: What's a chemical you've studied that smells strange?**

A: Geosmin. It smells like earth, especially after it has rained.

**Q: Can flavorings solve problems?**

A: Yes. In the United States, oranges have recently been attacked with a fungal infection that is greatly affecting the crop and their quality. Juice from these oranges doesn't taste sweet enough. But by using molecules naturally occurring in oranges, then synthesizing them in the lab, we can make juice from poor-quality oranges have the sweetness and taste we are used to. We call these "nature identical," meaning we make in the lab what nature makes in the natural world.

We also have a new technology that can convert fresh produce (which may be farm waste) into powders that retain color, taste and nutrients. For example, we can make a strawberry powder that can be added to smoothies using berries that would otherwise be wasted. We can thus prevent waste and provide nutritious solutions.

**Q: What's new in the flavor world?**

A: The sit-down lunch and breakfast have been replaced by smoothies and protein bars. Natural offerings have increased significantly to meet customer demands.

Also, flavors have gone global because more people are traveling internationally. We eat something far from home and then want it in our grocery stores.

**Q: So chemists like you try to make those flavors. Could you possibly make a type of pepper that won't make us sneeze?**

A: It's possible! Piperine is the active component in pepper that makes us sneeze.

**Q: What's the long-term goal for your work?**

A: My goal is to continue to make products that are tasty, healthy, nutritious and better for the planet.

## Quiz

1 Read the following selection from the article.

*Embracing chemistry helps us appreciate our amazing world and not fear it. I wanted to be a chemist to solve problems. My specialty, toxicology, helps create a safe world. Arguably, toxicology is the oldest scientific discipline, as the earliest humans had to recognize which plants were safe to eat.*

What conclusion is BEST supported by the paragraph above?

- (A) The study of toxicology has not significantly changed throughout human history.
- (B) Toxicology is primarily the study of which plants are safe for human consumption.
- (C) People who study toxicology learn what food is safe by studying early humans.
- (D) Some understanding of toxicology has always been necessary for human survival.

2 Which sentence from the article BEST explains how the flavor world is responding to changes in how we eat today?

- (A) I've worked on a plant extract that makes your mouth tingle and another that makes everything you taste after, even a sour lemon, taste sweet.
- (B) We call these "nature identical," meaning we make in the lab what nature makes in the natural world.
- (C) Natural offerings have increased significantly to meet customer demands.
- (D) My goal is to continue to make products that are tasty, healthy, nutritious and better for the planet.

3 How did Uma Parasar affect the production of orange juice?

- (A) She created a cure for a fungal infection that affected the orange crop.
- (B) She invented a natural substitute for orange juice that can be synthesized in a lab.
- (C) She determined that oranges could be made into a powder for use in smoothies.
- (D) She ensured that poor-quality oranges could still be used to make flavorful juice.

4 Which of the following MOST influences a person's sense of taste?

- (A) the tingling sensation caused by food
- (B) the smell that is emitted by food
- (C) the overall sweetness of a food
- (D) the amount of vanillin in food