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Jungle fruits and ketchup: A nutritionist explains how those lost in the wild survived on bare basics

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Earlier this year, the Colombian navy rescued a sailor from Dominica who survived for 24 days on ketchup, garlic powder and seasoning cubes after his boat was swept out to sea. And more recently, four children lived for 40 days in the Amazon eating cassava flour and rainforest fruits.

Both of these news stories are reminders of the incredible resiliency and adaptability of the human body, says FIU dietetics and nutrition expert Catherina Coccia.

But how exactly does the body adapt? And could a condiment, like ketchup, really provide any nutrition? Coccia, a registered dietitian and associate professor in the Department of Dietetics and Nutrition in FIU's Robert Stempel College of Public Health and Social Work, breaks down the science behind how our body survives when food is scarce.

What's happening in the body when it's forced to go without food?

Scientists have used animal studies along with some human studies to answer this question. Due to the ethics of researching this, human studies have only looked at people who go on hunger strikes or lived through natural disasters and didn't have a lot of food available.

It's actually an interesting and amazing phenomenon how the body can adapt. Research has revealed that after 24 hours, your body switches its

primary energy source from glucose (sugar) to fat and protein. Then, if you go 2 or 3 days longer, it tries to conserve protein and really use fat energy stores as the primary energy source. This process is how the body essentially tries to "make up" for missing food.

In extreme cases, like these recent news stories, it is possible to survive with little to no food when there is freshwater available. The sailor collected rainwater in a cloth to drink. And the fruit the children in the Amazon were eating provided vitamins and minerals as well as a little water. This water sustained them, making sure everything in their body was working as it should. For example, even our blood pressure is dependent on how much water we drink.

What are some negative impacts that can happen when we don't have access to food?

Even in very short period of times, we know people can get "hangry" but it goes beyond that.

A cascade of negative things can happen. Many psychological and neurological and psychological outcomes have been documented. Starvation impacts our consciousness and can cause delusions and even psychotic episodes. Our kidney can stop working, leading to renal failure. Even starvation colitis can also happen.

Once you are in a period of starvation, it is more difficult for your body to just go back to normal. You can have refeeding syndrome, which is extremely life threatening. Think of it like this: You can't go from the point of starvation to eating a McDonald's Big Mac. Your body cannot handle going from zero to 100. You have to start eating again very slowly, easing back into it so your body can get used to metabolizing food again.

In the case of the sailor, does ketchup actually even provid any nutrition?

It's not enough to really write home about, but ketchup has a little bit of nutrition—sodium, and a little bit of potassium from the tomatoes—and sugar that provides some calories.

What's interesting and important to note, though, is in addition to the ketchup the sailor was also consuming seasonings that would have added a little more sodium to his diet. Why does this matter? It was providing a source of electrolytes.

Electrolytes—like sodium, potassium, chloride, magnesium, calcium, phosphate and bicarbonates—are important minerals that are vital for basic life functions. They are in your blood, tissue and body fluids, and they do a lot to keep you alive. They actually keep your heart beating!

What role do electrolytes play?

Electrolyte levels work in balance with the amount of water in our bodies. They balance out our acid base or PH levels to keep everything in check. They also are especially important when it comes to the processes that create the energy out of fat and protein as they help move nutrients into your cells, which helps your body function.

Electrolytes replenish everything we sweat out. If you've ever seen someone after they've gone on a long run or done a half marathon, you've maybe seen a layer of salt on their skin. That salt is what they sweated out. The sailor who was stuck at sea was likely sweating a lot, and that sodium and other minerals would have helped him balance out his electrolyte levels.