

How to keep fresh fruits and veggies from going AWOL

June 7 2013, by Mick Kulikowski



Researchers with N.C. State University's Plants for Human Health Institute are developing food ingredients for healthy, shelf stable U.S. Army rations, which involves infusing protein powders and flours, like soy or hemp, with nutritious compounds extracted from fruits and vegetables such as muscadines and kale. The ingredients can be used in drinks, power bars and other healthy snacks for soldiers. The pyramid of powders (clockwise from top) consists of the original soy flour, kale-infused flour and muscadine grape-infused flour.

Keeping fruits and vegetables fresh while shipping them halfway around

the planet presents logistical challenges that even the U.S. military can't solve.

Now NC State is working with the Army to infuse protein powders and flours with healthy chemicals extracted from [fruits and vegetables](#) to provide nutritious – and tasty – meals for soldiers thousands of miles away from California vegetable patches or North Carolina strawberry fields.

If you can imagine sucking all the healthy goodness out of a food and putting it into something that is portable and tastes good – Wasn't this supposed to be the idea behind "V-8"? – then you're on the right track.

NC State researchers located at the Plants for Human Health Institute in Kannapolis, N.C. extract healthy compounds from muscadine grapes and kale greens and incorporate them into drinks, power bars, cookies and other [staples](#) of MREs, or meals ready to eat. What do we mean by "healthy compounds"? Think of things like anthocyanins, the pigments that give grapes their blue, purple or red color and combat [chronic diseases](#) and cancer, and glucosinolates, the compounds in kale that have cancer-fighting properties.

The kale and muscadine extracts go through a series of steps to remove unneeded sugars, fats and water, which reduces the final product weight and makes it easier to concentrate the health-promoting compounds. The resulting juice mixtures are combined with protein powders or flours – soy-based for the muscadine mix and hemp for the kale – to create healthy, shelf-stable [food ingredients](#).

How do the NC State researchers know this will work? Let's look at the research.

Last year, NC State and Rutgers University researchers showed, in the

journal [Food Chemistry](#), that soy-based flour can efficiently absorb the extracted health-promoting compounds from produce – blueberries and cranberries – while also separating out unneeded sugars and water.

In another [Food Chemistry](#) paper published late last year, NC State and Rutgers researchers found that soy-based flour not only captures the healthy chemicals extracted from plants – in this case, cinnamon – but that the resulting combination of soy flour and cinnamon proved effective in combating diabetes in obese mice.

And earlier this year in the journal [Pharmacological Research](#), NC State and Rutgers researchers reported that obese mice fed with a mixture of soy-based flour and blueberries showed health benefits like reduced body weight and lower cholesterol.

Provided by North Carolina State University

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