Armies are said to “move on their stomach,” and not too long ago that required plundering the local populace; not precisely the way to win hearts and minds. Napoleon offered a prize for a means of food preservation, Nicholas Appert won the prize with his technic of canning, preserving food in, well, tin cans. Food preservation remains an essential requirement, especially as our food-supply chain grows to global proportions. The goal then and now is to stop or retard bacteria from degrading our food and to keep oxygen away, because it accelerates food’s demise. A group of scientists is demonstrating a new approach that both preserves food and reduces fear.

Our current armamentarium of antimicrobial agents includes scary sounding chemicals, like sorbates or benzoate and of course, the ever-popular nitrates; which largely act to lower the pH creating a less favorable acidic environment. To banish or at least mitigate oxygen we employ antioxidants, some that sound great like Vitamin C and others like sulfur dioxide, which is associated with acid rain, and provokes unwarranted anxiety for some consumers. It turns out that flavonoids, a natural plant chemical, found in fruits, vegetables, wine and beer may be a useful food preservatives.

The researchers consider naringenin, a flavonoid found in grapefruit, looking for antimicrobial and antioxidant effects. But flavonoids by themselves have little antimicrobial activity, they need to be further treated to facilitate attachment to cells, and that is a difficult process. Extracting flavonoids from plants is energy consuming, chemically synthesizing them is both challenging and expensive; but our friends, the yeast, makers of bread, beer, wine and a range of other products like medicine, could produce these more antimicrobial flavonoids at both a low cost and industrial
The compounds the researchers brewed up showed good, broad-spectrum antimicrobial as well as antioxidant activity. In tests described but not reported, meat and fruit juice kept at room temperature developed no bacterial contamination over 48 hours, while similar samples preserved with current commercial food preservatives did not. As a comparison, these foods lose their “freshness,” even with those icky sounding, fear-inducing, but safe commercial preservatives in as little as six hours.

Now while this is just a small study and it appears to be scalable to industrial methods and quantities; we should not be looking for them in our foods just yet. Some of the activity was due to other chemicals produced in the brew, and those agents need to be identified and shown to be safe. And of course, there is always going to be further testing for safety. But that being said, the work does offer a great solution to those with big (and unfounded) fears of our current food preservatives. Science is providing us a new means to have our cake and eat it too, even if it is a day or two old - and our only concern will be the added calories.

Source: Antimicrobial and antioxidant activities of phenolic metabolites from flavonoid-producing yeast: Potential as natural food preservatives  Food Chemistry DOI: 10.1016/j.foodchem.2018.07.077