

Doctors create gum that helps promote tooth health

13 November 2009, By Mary Meehan

With the help of a gum chomping machine and years of careful chemistry, University of Kentucky researchers have developed a chewing gum that can help replace toothpaste and a toothbrush, thus improving the health of soldiers in the field as well as children in poor countries.

Seriously. [Gum](#).

In what is known around the UK College of Pharmacy by the ever-so-catchy title of "the military gum project," an antimicrobial, known as KSL, is infused in [chewing gum](#). KSL is anti-adhesive and abrasive agent that disrupts and helps dissolve plaque.

And, as every toothpaste commercial has told us for years, fighting plaque is key to good dental health.

Since World War I, thousands of American soldiers have suffered from the extreme form of gingivitis that can result in painful ulcers, infection and bleeding gums. You've probably heard it called "trench mouth."

"Between World War II and Korea and Vietnam those numbers have not been changing," said Geoffrey Thompson, Commander of the U.S. Army Dental and Trauma Research Detachment, that sponsored the research at UK.

Even today, about 15 percent of all Army sick calls are related to dental problems, said Thompson, who is both a colonel and a dentist.

Not only do poor [teeth](#) take active soldiers out of duty, but getting treatment can put others in harm's way. For every soldier who must be transported to a dentist in Iraq, Thompson said, seven others must ride in a convoy over often treacherous roads.

There are other practical considerations, said

Deluca, a professor in the department of pharmaceutical sciences at UK, who began the research in 2005. Soldiers have told him even the white spot left by rinsing toothpaste can help enemy trackers locate soldiers on the move. And, he said, if a soldier can pack one more bullet or a toothbrush, you can guess what he or she is going to pick.

"It's something that is going to be very beneficial," said Pat DeLuca, a professor in the department of pharmaceutical sciences at UK, who began the research about five years ago.

The gum could also be key in protecting children in impoverished nations from potentially deadly infections, said Abeer Al-Ghananeem, assistant professor of [pharmaceutical sciences](#) who took over leading the research last year.

For example, she said, children born with AIDs in Africa often have serious and painful dental problems. The gum could enhance their quality of life.

The chemical challenge, DeLuca said, was making sure the plaque fighting agent was released over the course of a good chew, maybe 20 to 30 minutes, not in a burst with the first chomp.

The chewing machine, which operates a series of small pistons that mimics the pressure and pace of a human bite, was key to measuring chemical release of the active ingredients. Owned by the Army, Thompson estimates the equipment cost between \$100,000 and \$200,000.

Tiny drops of imitation saliva were tested until the precise chemical measure was consistently received.

While the machine helped determined the chemical makeup, the taste, which is a crisp wintergreen, was determined the more old-fashioned way. Al-

Ghananeem and her researchers did a fair amount of chewing.

Clinical trials will begin and then the Army will look for a manufacturer to actually produce the gum, Thompson said. Al-Ghananeem envisions that eventually it will be commercially available over-the-counter for use by, perhaps, hikers going on remote treks. It is not designed, she said, to be a long-term replacement for toothbrush and toothpaste.

Still, DeLuca said, something as seemingly simple as gum "can have amazing possibilities."

"We are looking forward to some sort of global attention to the whole project," Al-Ghananeem added.

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