

# Research Rundown

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## Feeding Utah seniors could save tax dollars

Most states could save money in the long run by investing more in programs that deliver meals to the elderly, according to a new study. Meal programs reduce the number of low-income seniors in costly nursing homes by helping them live independently. According to the study, if the U.S. had included 1 percent more seniors in meal programs in 2009, nearly 2,000 more Medicaid recipients would have been able to live at home, and 26 of the lower 48 states would have saved money as a result.

To reach these estimates, the researchers examined the number of seniors using meal programs and nursing homes and how much these services cost across the country. They also looked at how many Medicaid patients living in nursing homes were “low care,” meaning that they might have been able to live independently if their meals were delivered. The results varied widely from state to state. Pennsylvania would have saved about \$6 million in 2009 by feeding an extra 1 percent of its seniors, while a similar policy change would have cost Florida \$11.5 million. Utah would have seen modest savings of around \$13,000.

The researchers used a simple, across-the-board meal program expansion for their model, but they advocate a more customized approach. They believe states could see greater savings by taking the local population into account and making sure meals reach the seniors who need them most.

The results were published in the October issue of “Health Affairs.”

## Pig manure may infect people with superbugs

If you live near a field fertilized with manure, you may be at increased risk of getting antibiotic-resistant infections, according to new research. Medical records from northeast and central Pennsylvania revealed that people living near high-density animal farms and manure-fertilized fields had more infections from methicillin-resistant staphylococcus aureus. MRSA causes hard-to-treat infections in many parts of the body, particularly skin and soft tissue. Pig manure was the most dangerous risk factor, accounting for 11 percent of MRSA infections acquired in the study communities.

Nearly four-fifths of all antibiotics in the U.S. are fed to farm animals, according to Joan Casey, first author of the study. Farmers add antibiotics to animal feed because it allows them to raise animals in crowded conditions that would normally facilitate the spread of disease. But this boost in productivity may come at a cost to public health, triggering the evolution of bacteria that are immune to antibiotics. Previous research revealed that three-quarters of antibiotics fed to animals are not absorbed and end up in manure, and antibiotic-resistant bacteria have been found in meat, in the bodies of farm workers, in manure, and carried by wind and soil hundreds of meters from fertilized fields. In the rural areas Casey studied, community-acquired MRSA infections were increasing by about 34 percent per year.

Casey would like to see farmers stop feeding antibiotics to animals that are not sick. Failing that, she recommends more transparency in farming practices. Currently farmers aren't required to report their antibiotic use, making it difficult for researchers to track the consequences.

The study was published online Sept. 16 in "JAMA Internal Medicine."

## **What's really in your herbal supplements?**

The contents of herbal supplements rarely match the label, according a new DNA analysis. Most of the 44 tested products contained unlisted plant species, and nearly a third of the samples did not even contain the herb supposedly being sold. The research team is concerned that consumers don't have access to potentially beneficial herbal remedies and may face health risks from contaminants.

Many herbal supplements contained unlisted fillers such as rice or wheat, which are dangerous to people with allergies, and several contained potentially toxic plants. For example, one product being sold as St. John's wort was actually a laxative herb called senna, which can damage the liver and digestive tract with prolonged use. Only two of the 12 companies tested did not have any contaminated products.

Dietary supplements are classified as food by the FDA, allowing them to escape the strict safety regulations in place for drugs. There are rules regarding supplement labeling and purity, but the new study adds to a growing body of evidence suggesting that the rules are rarely enforced.

In the past, it has been hard to identify herbs sold in powder or capsule form, but the study's authors at the Biodiversity Institute of Ontario have a solution. They are developing a standardized system to test herbal supplement quality using DNA barcoding, which identifies samples by isolating short pieces of DNA and matching them to known sequences in a DNA library. The researchers hope the supplement industry will adopt the system as a way of proving to consumers that their products are pure.

The study was published this October in "BMC Medicine."

## **Conquer fear while you sleep**

Scientists have found a way to reduce fear by changing people's memories while they sleep. The study used memories of mild electric shocks delivered in a lab, but it could some day pave the way for sleep therapies to treat phobias and post-traumatic stress disorder.

The researchers created fear memories by exposing people to scents and images of faces while delivering electric shocks. Particular scents and faces were always presented together during training, and afterward either the scent or the face was enough to cause fear by reminding people of being shocked.

Subjects took a nap after the training session, and when they entered slow-wave sleep, the researchers began pumping in one of the scents. The sleeping subjects started to sweat when the scent first hit them, but their fear response gradually subsided as exposure continued. After waking, subjects showed significantly less fear in response to the scent and the face it had been paired with during training. They were still afraid of other faces and scents that had been paired with shocks.

A second group of subjects went through a similar procedure, but they watched a nature documentary instead of taking a nap. Unlike sleepers, awake subjects showed a gradual increase in sweat response as the scent was administered, and they were still afraid of the scent after the documentary. This suggests that fear memories are particularly flexible during sleep, when peoples' brains are manipulating and consolidating memories. If therapists can find ways to trigger old memories in unconscious patients, people with phobias may someday be able to skip traditional exposure therapy and take a nap instead.

The study was published online Sept. 22 in "Nature Neuroscience."

## **Experimental ovary slice-and-dice yields healthy baby boy**

A woman who stopped ovulating at 29 has given birth to a healthy baby boy, thanks to a radical new fertility treatment. The procedure involved cutting one of her ovaries into tiny pieces, treating the fragments with drugs, and re-implanting them near her fallopian tube. This stimulated tiny dormant egg cells in the treated fragments to develop into mature eggs, which the researchers removed for in vitro fertilization. The new mother is one of several women with primary ovarian insufficiency who are undergoing the experimental treatment in Japan.

Human ovaries start out with about a million immature eggs, and in most fertile women the eggs mature and are released at a rate of one per month. It has been known for

decades that cutting or drilling into the ovaries of infertile women can sometimes stimulate egg growth, but until recently no one knew why. The Stanford-based team discovered that cutting ovaries disrupts a signalling pathway that keeps immature eggs dormant. They also found that PTEN, a protein known to inhibit cell growth in many tissues, plays a role in keeping eggs from developing, and it is possible to inhibit PTEN with drugs. Cutting the ovaries and treating them with drugs to block PTEN resulted in more egg development than either technique alone.

All of the women in the study had primary ovarian insufficiency, but only eight still had immature eggs, so not all women with POI can benefit from the treatment. Women who are infertile for other reasons, including chemotherapy and polycystic ovary syndrome, may also be able to have children with the new method.

The study was published online Sept. 30 in “Proceedings of the National Academy of Sciences.”