



NUTRITION AND HEALTH

An Ounce of Prevention

Some 90% of the nation's \$3.3 trillion spent on healthcare goes toward chronic and mental health conditions, such as heart disease, cancer, diabetes, arthritis, Alzheimer's and obesity. Through research and education, land-grant universities are discovering new ways to prevent or minimize the impact of these diseases.

HERE ARE A FEW EXAMPLES OF THE WORK:

- Biomedical science has relied on immunodeficient mice to test stem cell therapies and cancer drugs, but a better model that's closer to human biology is the pig. **Iowa** researchers discovered the first pigs with naturally occurring severe combined immunodeficiency—an immune system trait that makes them uniquely suited to testing medical therapies for people. This more human-like model could shorten the time it takes to develop life-saving technologies.
- Research in **Illinois** shows a connection between consuming deep-fried foods and certain forms of cancer. The study monitored the metastasis of certain tumor cells in animals that consumed fresh oil versus deep-frying oil. Data showed the development of more lung cancers, indicating that consuming deep-fry oil was a risk factor for breast cancer metastasis.
- Lack of physical activity costs the nation \$117 billion annually for healthcare issues, with only 12% of older adults

achieving minimum exercise recommendations. A **Wyoming** Extension program teaches behavioral strategies and nutrition, with participants reporting improved balance (70%), improved lower body strength (50%) and improved aerobic endurance (50%).

- A **Missouri** Extension program targets adults with one or more chronic conditions, teaching them self-management techniques such as dealing with fatigue, pain and isolation and optimizing medications, nutrition and physical activity. Related research has found that these kinds of educational interventions provide an approximately \$750 per person savings in medical costs—a potential economic impact of nearly \$115,000 for the 314 Missouri participants in 2017—as well as a 5% drop in emergency room visits.

MAKING HEALTHY FOOD HEALTHIER

What if eating certain kinds of food could reduce the development of cancer, diabetes and Alzheimer's? Functional foods could prove to be a simple, effective way to prevent or reduce prevalence of these and other chronic degenerative diseases. **Ohio** researchers studied different kinds of functional foods containing potentially beneficial bioactive ingredi-

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ents. The foods included a soy-tomato drink, strawberry and black raspberry confections and soy bread. They evaluated taste and texture of the foods and concluded the studies with clinical trials. They found that the most effective cancer preventer was a gummy version of a raspberry confection because its chewiness meant it remained in the mouth for the longest amount of time.

Can goats' milk be an effective delivery system for more heart-healthy nutrients? Only 22% of Americans' diets meet

the American Heart Association's recommendation for consumption of omega-3 fatty acids, which can help prevent chronic diseases. **Texas** researchers fed omega-3-rich fish oils to goats, and preliminary results showed the resulting milk had increased levels of omega-3s. Worldwide, more people drink the milk of goats than the milk of any other species. Consumption of goat milk and milk products in the United States is increasing, with more than 11 million pounds of goat milk produced annually.

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The Land-Grant University System is a uniquely American institution, and has operated successfully for more than a century. The landgrantimpacts.org website documents and demonstrates the collective and individual impacts of the national system of joint teaching, research, and extension institutions.

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