

HEALTH AND WELLNESS



Americans spend \$3 trillion annually, or an average of more than \$9,500 per person, on health care. But a healthy lifestyle — and an environment that promotes healthy living — can significantly reduce the illnesses and frailties that eventually require medical care. In addition, research can provide insights into novel ways to fight new threats such as Zika virus and the age-old menace of cancer. The Ohio State University has the knowledge and expertise to tackle such issues.

MAKING HEALTHY CHOICES THE EASY CHOICES

More than 20 percent of U.S. teens are obese, and nearly 6 in 10 teens aren't physically fit. Other issues, including sleep deprivation, drug and alcohol use, and emotional well-being, also loom large for today's adolescents.

That's why Ohio 4-H sent a small delegation to the National Youth



Summit on Healthy Living in Washington, D.C., in 2015 and 2016. At the first summit, the team saw a "Smoothie Bike," a stationary bicycle with a blender powered by pedaling. Thanks to a private grant, the team purchased the bike to draw attention to both physical activity and nutrition. In its first year, the bike was featured at an average of three events per month statewide. More than 2,000 Ohioans who put their feet to the pedals learned it would take more than an hour of moderate biking to burn off the calories in a milkshake compared with just 15 minutes of cycling to burn off a healthy smoothie.

Now, the Ohio 4-H Healthy Living program is spreading the word that young people can have a strong voice in advocating for healthy changes, not only individually but also community-wide. A November summit drew 38 teens from around the state, who

developed action plans to help make their communities healthier places.

More: go.osu.edu/healthyliv



NEW WEAPON IN FIGHT TO COMBAT MOSQUITOES

Mosquitoes that transmit dengue, malaria and Zika virus are developing resistance to traditional insecticides. Ohio State entomologists believe they've uncovered a new biological weapon in this fight: make mosquitoes unable to pee.

Female mosquitoes rely on their Malpighian tubules, which are the equivalent of kidneys, when consuming a human blood meal. They may ingest the equivalent of their own body mass in blood, so they need to immediately get rid of the excess fluid they consume. They actually urinate on their host while feeding.

The team, which includes researchers at Cornell and Vanderbilt universities, has identified a chemical that interferes with mosquitoes' "kidney" function, rendering them bloated and unable to fly, all leading to a shorter lifespan. The team hopes its ongoing research leads to next-generation mosquito-control products that will not be harmful to beneficial insects, including honeybees and other pollinators.

More: go.osu.edu/mosquitoes

ASSESSING HEALTH NEEDS OF COMMUNITIES

The Affordable Care Act requires nonprofit hospitals and health providers to conduct a community health needs assessment every three years. Ohio State University Extension can help.

Already, OSU Extension has worked with Clinton and Highland counties to gather and analyze data on local health concerns and challenges. Health assessments can reveal eye-opening trends, which is just what happened in these communities. For example, in 2016, the Highland County survey revealed that, overwhelmingly, the public's primary health concern wasn't cancer or obesity, but illegal drug use. In fact, 70 percent of respondents personally know someone who uses illegal drugs such as heroin and methamphetamine. Respondents also believe the county doesn't have adequate resources to deal with these drug abuse and mental health issues.

Similar findings in Clinton County in 2012 directly led a local nonprofit to create and fund a new position to start addressing these needs.

More: go.osu.edu/communityhealth

A NEW APPROACH TO FIGHT CANCER

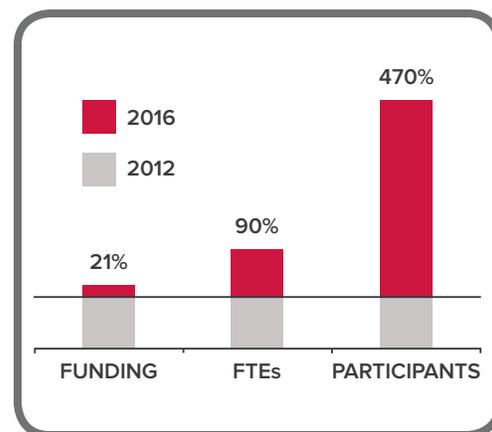
Cancer will claim an estimated half-million American lives in 2016. Consumption of fruits and vegetables, along with the antioxidants they provide, has long been known to provide some protection. But until now, scientists have not had a way to determine the relative importance of different antioxidants in controlling a cancer, or how the antioxidants might work together.

In an Ohio Agricultural Research and Development Center-led multidisciplinary study, researchers collected 75 samples of black raspberries, each representing different varieties and growing and harvest conditions, and made extracts to use in testing. Using metabolomics, an emerging technique to monitor all metabolites present in cells, the researchers identified bioactive compounds from each sample and measured how the compounds act against colon cancer cells.

As a result, the researchers were able to compile a list of compounds effective against cancer in order of importance. Together with the fruit's pigments, these compounds halted cancer cell division and, in some cases, caused cancer cell death.

This approach can be used to study the effectiveness of compounds from any type of produce against any type of cancer. Health researchers can use this information to determine how each stage of cancer development is affected by different compounds at different concentrations, and plant breeders can draw on it to develop new varieties that contain the most effective compounds.

More: go.osu.edu/BjCZ



NUTRITION EDUCATION: A LITTLE MORE GOES A LONG WAY

OSU Extension's community nutrition education programs have experienced significant gains in federal funding in the past four years, rising from \$5.7 million in 2011–12 to \$6.5 million in 2014–15. With that funding, staffing has increased from 74 full-time equivalents to 141.

But even more significant is the number of Ohioans participating in these programs, which has increased nearly fivefold in those years, from 53,539 to 251,324. That means with a 21 percent increase in funding, Extension's community nutrition programs increased staff by 90 percent and participants by 470 percent. OSU Extension has leveraged the relatively small increase in funding to help many more Ohioans hone their skills in choosing and preparing healthy foods on a budget, and becoming physically active every day.

Supporting these sessions are two new community nutrition efforts. A statewide social marketing campaign, in collaboration with several state agencies, is focusing on the importance of increasing fruit and vegetable consumption. Also, Ohio SNAP-Ed, the education program for those receiving Supplemental Nutrition Assistance Program benefits, is working with Case Western Reserve University to develop an online tool that community stakeholders can use to determine which food and/or physical activity interventions would have the greatest chance of success locally.

More: go.osu.edu/snap-ed and go.osu.edu/efnep



Black raspberries