

## **Betsy says HI!!!!**

### **Announcements:**

- The next LABQUEST meeting will be Wednesday, April 10, 2024 at 12:30 in the trailer.

### **Science Report Highlights**

Betsy and Dan thought all the items in following science report (below) from Charles were interesting but most liked the following:

- Gastric Reflux
- End of PFAS in US Food Packaging
- Microplastics Found in Human Arteries
- Chronic Pain Management with Focused Ultrasound
- Oral Health Linked to Dementia and Heart Disease
- Gene-Engineered High Antioxidant Purple Tomato
- Clothes Washers and Dryers to Get More Efficient
- \$819 Million Potomac River Tunnel Contract

### **Science Report**

#### **Self-Protective Measures -**

You should get your medical advice from official sources, your doctor, or your pharmacist ... not from this Report or the internet. Per recommendations by FDA and CDC, everyone should maintain current vaccinations for the three respiratory viruses: Covid, flu and RSV (for RSV, adults [over 60](#) and children [younger than 8 months](#)) - unless your doctor advises against it based on your medical record. Adults over 50 should have had the [Shingrix vaccine for shingles](#) (two doses 2 to 6 months apart, good indefinitely).

- [RSV](#) - CDC advice on recognizing the symptoms of RSV, [here](#). Prevention by vaccination is best. Update 3/7/24: [Early data](#) from the CDC health surveillance network indicate that the RSV vaccine nirsevimab - "... was 90% effective at preventing RSV-associated hospitalization in infants during their first RSV season." [Luis F.]
- [Gastric Reflux](#) - See the study in the Journal of Dental Research showing that chewing sugar-free gum for 30 minutes after an acid-reflux-generating meal modestly reduces gastric reflux, [here](#). Chewing other pH neutral saliva inducing foods might also work. [Chad C.]
- [NIH BMI Calculator](#) - Use the [NIH](#) National Heart, Lung and Blood Institute [calculator](#) to find your Body Mass Index (BMI). Above 25 - overweight. Above 30, check with your doctor, consider better nutrition, and exercise.

#### **Vaccine and Therapeutic News -**

- [Weight Loss Drug Helps with Cardiac Issues](#) - FDA has [approved](#) an extension of use for the previously approved weight loss drug Wegovy to reduce the risk of cardiovascular death, heart attack and stroke for obese and overweight persons ([>70% of US adults](#)).
- [Relapsed or Refractory Follicular Lymphoma](#) - FDA has approved the use of [Brukinsa](#) (zanubrutinib) with obinutuzumab for this condition - [BeiGene](#) USA (Cambridge MA and Beijing China).

- Unresectable or Metastatic Urothelial Carcinoma - FDA has [approved](#) Opdivo (nivolumab) for use in combination with cisplatin and gemcitabine for this condition - [Bristol-Myers Squibb](#) (Princeton NJ). Note the prior use approvals for Opdivo, [here](#), and the FDA collaboration with Australian, Brazilian and Swiss regulatory agencies for this review. Well done.
- Fatty Liver Disease - FDA has [approved](#) Rezdifra (resmetirom) for the treatment of noncirrhotic non-alcoholic steatohepatitis ([NASH](#)) with liver scarring (fibrosis). [Madrigal Pharmaceuticals](#) (West Conshohocken PA)
- TIL Therapy for Advanced Melanoma - The first product from this new, genetically engineered class of cancer treatment, using tumor-infiltrating lymphocytes ([TIL](#)), has recently been approved by FDA. This opens the door, with clinical trials for several other types of cancer presently in progress using this technology - originally developed in a decade-long effort by researchers at NIH NIH has put in place a Cooperative Research and Development Agreement (CRADA) with [Iovance Biotherapeutics](#) (San Carlos CA) to commercialize the new treatment 'lifileucel'. Expect more news about TIL.

### Other Health Science News -

- End of PFAS in US Food Packaging - See the statement of Jim Jones, Deputy FDA Commissioner for Human Foods, [here](#). In 2020, FDA presented the food industry with FDA laboratory data on the presence of PFAS in foods that had been in contact with PFAS-treated packaging. It was [voluntarily agreed](#) that PFAS would no longer be produced for that purpose, and would be phased out over a three year period starting in 2021. See the February 28, 2024 announcement on the end of PFAS in food packaging [here](#), and note the continuing PFAS sampling being done for filter feeder molluscs such as clams, oysters, mussels and scallops. Summary: no more PFAS grease proofing for popcorn bags, fast-food wrappers, and paperboard containers. Great work by FDA, operating by consensus with industry, based on scientific evidence. Well done to all parties!
- Certain Foods Increase Blood Levels of PFAS - Details, [here](#). Summary: pork, candy, sports drinks, processed meat, butter, chips, bottled water. Research by University of Southern California, [here](#). We got where we are step by step, and that's how to back out. FDA has gone first (see above bullet), to be followed by the final rule for EPA's tightened PM 2.5 air pollution standard. Then the final rule for EPA's mandatory drinking water standard is probably next up (expensive). These are good first steps.
- Microplastics Found in Human Arteries - The smoking gun study is public, [here](#) - "... those with microplastics present in their arteries were nearly five times more likely to suffer a heart attack, stroke, and in the most serious cases, death." [Publication](#). Microplastics have also been [found in the heart](#), mostly polyethylene and PVC.
- Double Amputee Gets New Arms Attached - He [lost his arms](#) from being [run over by a train](#). Then surgeons replaced them by attaching arms from an organ donor. Now he has just been released from the hospital with *her* arms. Spectacular!
- Chronic Pain Management with Focused Ultrasound - The Insula is the portion of the brain that deals with the perception of pain. A recently published proof of principle [study](#) by researchers at the Virginia Tech School of Medicine suggests that modest pain relief may be possible without opioids or invasive physical intervention using an [ultrasound technique](#).
- Oral Health Linked to Dementia and Heart Disease - 90% of adults ages 20 to 64 experience tooth decay, while almost 50% of adults 45 to 64 have gum disease. A published study showed that those with gum disease were twice as likely to have a heart attack, and three times as likely

to have a stroke, than those without inflammatory gum disease. See [6 recommendations for good oral health](#) from the American Dental Association.

- [Blood Test for Early Stage Dementia/Alzheimer's?](#) - researchers in the UK think they may be on the trail of a [simple, cheap test](#). See a published study on the subject [here](#). More validation work needed.
- [Are Your Stools Healthy?](#) - Check the Bristol Stool Chart [here](#). Ideally you should be a Type 3 or 4. This simple check, that you can routinely do yourself in a few seconds, may help catch a problem early, and could provide important information for your doctor. [Details](#).

## Practical Nutrition -

- [Gene-Engineered High Antioxidant Purple Tomato](#) - Due to a 2022 update/streamlining of US Department of Agriculture (USDA) regulations, the [Norfolk Plant Sciences \(NPS, Norwich UK\)](#) company's newly [gene-engineered purple tomato](#) now has [USDA approval](#) - not previously practical for a small company, opens the door to innovation. Well done USDA. The purple color isn't just in the skin, but extends through the entire body of the fruit. That's a sign of a [high level of the same class of antioxidants \(anthocyanins\)](#) that make fruits like blueberries and blackberries such nutritional powerhouses. Purple tomato also [passed FDA review in May 2023](#), with the Agency noting that "...human food from Del/Ros1-N tomato is not materially different in composition, safety, and other relevant parameters from tomato-derived human food currently on the market except for the intended anthocyanin change in Del/Ros1-N tomato." [Norfolk Healthy Produce](#) is the US subsidiary of Norfolk Plant Sciences, and is selling seeds to gardeners this Spring. More nutritional science details, [here](#). Same size as cherry tomatoes, but much more nutritious.
- [Hibiscus Tea Rich in Antioxidants](#) - compared to many other common natural beverages, [here](#). It can also significantly lower blood pressure, according to a recent [study](#) by scientists at the antioxidant lab in the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University. [thanks Chad C.]
- [Cacao Nibs](#) - are the fermented, dried ground contents of the cacao pod after the rind is removed - further details, and how they can be used, [here](#). Nutrition: antioxidants, no sugar, fiber, protein, good plant fats, copper, iron, phosphorus, zinc, magnesium. Often found bagged in the baking aisle at the grocery. Choose organic.
- [Benefits of Edamame](#) - Edamame are immature soybeans, best already shelled, and are healthy fresh or frozen. See 8 surprising health benefits as reviewed by a registered dietician, [here](#). Very nutritious.
- [Uses and Benefits of Bran](#) - Bran is the outer layer of whole grains (bran, the endosperm, and the germ) such as wheat, rice, oats, and rye. That's where much of the nutrient value of grains is located, so when the grain is 'refined', removing the bran, much of the nutrient value is lost. That's the reason for the emphasis on eating *whole* grains, like *whole* wheat or *brown* rice. See a nutritional analysis by a registered dietician, who also explains what bran does for your health, [here](#).
- [Healthiest Types of Bread](#) - Try these [8 types of bread](#) recommended by a registered dietician. Summary: sprouted (whole) grain bread, whole wheat bread, whole rye bread, whole grain bread with seeds, gluten-free whole grain, oat bread, sourdough bread, multigrain bread.
- [7 Healthy Food Surprises](#) - reviewed by dieticians, [here](#). Tune-up: Choose red or black grapes, and whole wheat sourdough. Special Note: Chilling and then reheating carbs like leftover rice, potatoes and pasta converts some of the carb content to resistant starches. They digest more

slowly, and therefore don't create the usual sharp blood sugar spike. Lowers the risk for Type 2 diabetes.

- Misleading Words For Sugar - High-fructose corn syrup, sucrose, barley malt, dextrose, maltose and rice syrup are all [forms of sugar](#).
- Is Your Favorite Food Ultra-Processed? - and if so, what's a good substitute. View the Northeastern University [TrueFood Dashboard](#).
- Most Nutritious Vegetables and Fruits Rank-Ordered by CDC - See the list [here](#). Chinese cabbage = bok choy.

### Environmental Science News -

- Mack Trucks Go Electric - Mack is investing \$14.5 million, plus a \$225,000 award from Virginia's Commonwealth Opportunity Fund, to add 72,000 ft<sup>2</sup> of manufacturing space to the company's existing Roanoke Valley Operations (RVO) manufacturing facility for making [Mack MD](#) (Medium Duty) trucks - including a new electric version to be called the [Mack MD Electric](#). Both the 'MD' and 'MD Electric' are designed for dry van/refrigerated, stake/flatbed and dump applications. The MD6 model does not require a Commercial Driver's License to operate for non-hazardous payloads, and is exempt from the 12 percent Federal Excise Tax. See also the 'Mack LR Electric Garbage Truck', [here](#). [good video]
- Make a Better Anode and They Will Come - The Israeli company [Addionics](#) (Tel Aviv Israel) is planning to build an [EV battery anode factory in the US](#) - presently doing its due diligence for about \$50 million in benefits under the US Inflation Reduction Act for the factory's first phase at \$120 million. The company's three dimensional Copper and Aluminum mesh anode designs are intended to substantially extend EV range. Sounds promising.
- Clothes Washers and Dryers to Get More Efficient - About [8% of a home's electrical use is for doing the laundry](#), not counting the energy to heat the water. The US Department of Energy has [announced](#) that it will be raising the Energy Star standards for washers (11% more energy efficient using 28% less water) and dryers (40% less energy) - all for the same results. The Association of Home Appliance Manufacturers has agreed to the changes, which will be effective for equipment sold after March 2028. US households will save \$2.2 billion/year.
- Advanced Countries Generated More Than Half Their Electrical Power with Zero Carbon Emissions - in 2023, for the first time in history. Wind and solar contributed 34%, with nuclear making up the rest. Great benchmark.
- Italy Phasing Out Coal - From the end of 2025 [all coal power plants in Italy will be closed](#). Well done!
- Human/Bear Conflict Reduced in Montana - by the use of smart dogs trained to chase off the bears. A biologist at the [Wind River Bear Institute](#) in Montana has trained [Karelian bear dogs](#), a Finnish breed, for this purpose. As she says - "The dogs have a body language, an animal-to-animal conversation that speaks much stronger to the bear than I can." Wise, and nonviolent.
- Urine and Vinegar Use to Extract Cobalt from Used EV Batteries - Scientists at Linnaeus University in Sweden, and the Indian Institute of Technology Madras in India, have designed a [liquid solvent derived from urine](#) and acetic acid that can [recover a high percentage of Cobalt](#) from used EV batteries. This [low energy](#) (inexpensive) process using readily available materials could relieve some of the supply constraints in making EV batteries.
- Oriental Pied Hornbill Back From the Dead in Singapore - The [hornbills](#) [photo] had been extinct in Singapore since the mid-1800s, until a pair was spotted in 1994. Starting in 2004 the Singapore Hornbill Project has been working on reintroducing them into the urban environment of Singapore. See the details, [here](#). [Greg K.]

- Extinct for More Than 200 Years - Hunted to extinction in the Atlantic, [Grey Whales](#) are back! One was [spotted this month](#) by a [New England Aquarium](#) (Boston MA) aerial survey team South of Nantucket - flying for the aquarium's [Anderson Cabot Center for Ocean Life](#). Greys are routinely seen in the North Pacific, and scientists speculate that the opening of the [Northwest Passage](#) due to climate change may have allowed the beginning of an interocean migration - easily spotted from lack of a dorsal fin. Welcome back beautiful swimmer!
- Environmentalists Launch Methane Leak Mapping Satellite - With a little help from SpaceX, and the government of New Zealand (thanks Kiwis), the Environmental Defense Fund (EDF) launched its own \$88 million [MethaneSAT](#) spacecraft into orbit from California last week. It is designed to detect and map methane emissions globally. EDF plans to name and shame polluters, including oil-and-gas drilling companies, large livestock operations, landfills, and the governments that should be holding them accountable - including Russia, Venezuela and Brazil. Details and photos, [here](#).
- \$819 Million Potomac River Tunnel Contract - has been awarded. DC Water has [announced](#) that work will begin this year, for operation in 2030. Specs: length 5.5 miles, diameter 18 feet, depth 100 feet, diversion/capture 93%, runs from upstream of Georgetown, along the Georgetown waterfront, then past the national Mall and the west side of East Potomac Park to join the now complete NE Tunnel under the Anacostia River (98% diversion/capture), and on to the Blue Plains Sewage Processing facility [Map](#). There will also be a short tunnel to intercept Piney Branch overflows into upstream Rock Creek.
- Expanding Solar Power in Brazil - [Equinor](#) (Stavanger Norway) has just opened its [Mendubim solar project](#) in northeast Brazil. The project will produce 1.2 TWh annually, with 60% pre-sold under a power-purchase-agreement to Alunorte, one of the world's leading suppliers of alumina for the aluminium industry.
- Community Power Grows in New Hampshire - [12 more towns](#) are expected to join community power in March, bringing in 30,000 additional customers statewide. The [Community Power Coalition of New Hampshire](#) now has 56 members representing about 30% of the population. Their base electrical rate dropped by 26% in the past year. Members have a choice of 100%, 50%, or 33% renewable power. [Barbara R, Harvey B.]

#### Other Science News -

- Ukraine Rolls Its Own MRAP - Modified Mine-Resistant Ambush Protected (MRAP) Vehicle. The [Inguar-3](#) is designed to work in close cooperation with Ukrainian Special Forces, and is manufactured in several mission specific forms. It has a 356-horsepower [Deutz](#) (Cologne Germany) [engine](#), multiple cameras, night-vision capabilities, steel and aluminum armor. [Details](#)
- Ukraine Makes Its Own Flying Claymore Mines - and is now using them mounted on first person view (FVP) drones as anti-personnel weapons. The customary [Claymore](#) shaped charge fires deadly ball bearings over a 60° arc 50 yards wide at a range of 50 yards. [Details](#).
- Battery-Electric Air Taxi - With the purchase of an existing building as an initial [manufacturing facility in Ohio](#) at the Dayton International Airport, Joby Aviation (Santa Cruz CA) is a big step closer to commercial production. The Dayton facility will make Titanium and Aluminum aircraft parts there for Joby's pilot production line in Marina CA. The company has already completed several levels of the multilevel FAA certification. Specs: eVTOL, pilot and 4 passengers, 200 MPH, vertical takeoff and landing, low noise. Cool film [here](#).
- Testing Space Robots for Off-World Construction - NASA recently gave the robots the plans for a moon shelter, and the [robots figured out how to build it!](#) That's quite a partnership. Structures

on the moon will need to be built from basic building blocks, made mostly of locally sourced materials. [Publication](#).

- [Robot Dogs Learn Parkour](#) - The Swiss engineers at ETH Zürich have been working on teaching their robot dog to close the mobility gap between robots and animals. Read about their progress, [here](#), and see a series of their videos, [here](#). Now see a video with 10 *human* Parkour moves, [here](#). The robodogs are catching up, but they're not quite there yet.
- [First Chinese Repair EVA on Tiangong](#) - After a 7.5 hour extravehicular repair mission, the crew of the Chinese space station Tiangong [successfully repaired](#) a faulty set of solar panels. Nicely done.
- [Successful Hypersonic Test - Stratolaunch](#) (Mojave CA) has announced the successful air launch of its [hypersonic test vehicle, the Talon-A \(TA-1\)](#) [spectacular photo!] from its gigantic 6-engined launch carrier appropriately named the [Roc \(world's largest operating aircraft\)](#). The single use TA-1 reached near hypersonic speed before making a planned water landing. Future versions of the TA series will be designed to make runway landings, and will be reusable. Details and [video](#). Mythological [Roc](#).
- [Bigger is Better](#) - and more efficient for wind turbines, with blades now as long as a football field. That's why offshore turbines are so large. Why, you might ask, aren't *onshore* turbines made equally large? Because we have no way to ship such a long, rigid object to its onshore assembly location. They don't bend around corners, or fit on trucks or railcars. So, we need a really BIG plane, the **world's new largest aircraft**, capable of operating from low quality temporary runways, and long enough that a rigid, football-field-long blade can fit inside. [Radia](#) (Boulder CO) has *WindRunner* on the drawing board: Length 356 ft, Height 79 ft, Wingspan 261 ft, Maximum Payload Length 344 ft, Maximum Payload Height 24 ft, Maximum Payload Width 24 ft. [Peter P. and Larry G. - they will need radically experienced pilots]

[Nice Thing](#) - [skip ads, full screen]

[Six versions of Blue Danube](#) - Johann Strauss II -

- Blue Danube - for geese - [here](#).
- Blue Danube - for adults - [here](#).
- Blue Danube - for piano - [here](#).
- Blue Danube - for dancers - [here](#)
- Blue Danube - on a carousel in New Mexico - [here](#)
- Blue Danube - in a dream, and in love, in Vienna - [here](#).