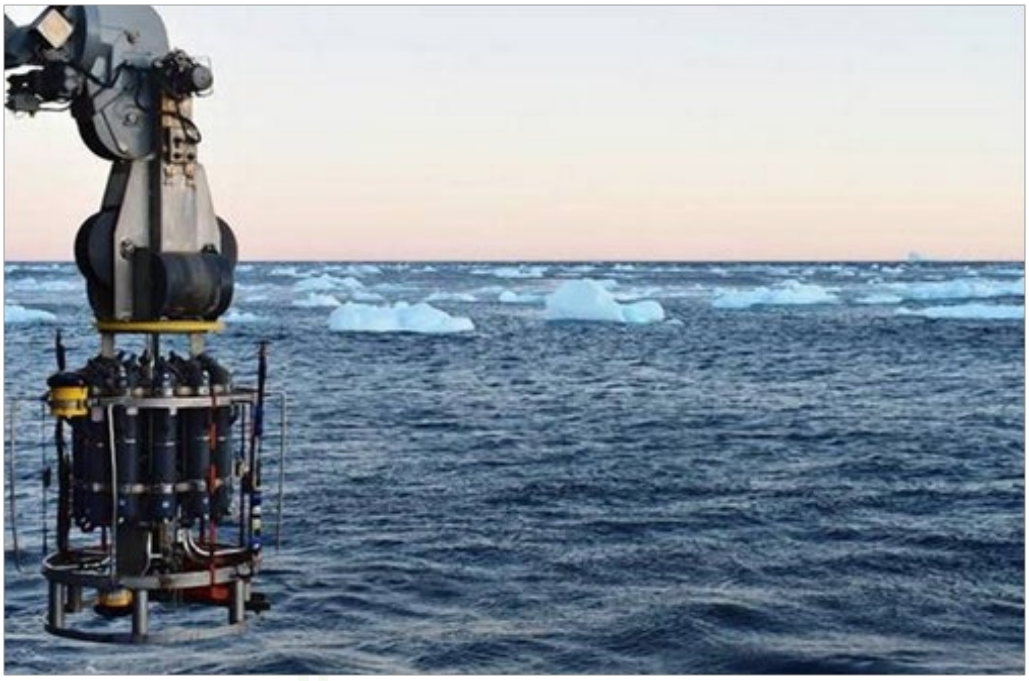
1. Ocean mixing that drives climate found in surprise spot

Challenges the long-held view that it was in the Labrador Sea

One of the key drivers of the world's climate is an area in the North Atlantic Ocean, where warmer and colder water mix and swirl.



When scientists went for their first close look at this critical underwater dynamo, they found they were looking in the wrong place by hundreds of miles.

Before the chaos

The consequences are not quite yet understood, but eventually it could change forecasts of one of the worst-case global warming scenarios still considered unlikely this century, in which the mixing stops and climate chaos ensues.

It's called the **Atlantic Meridional Overturning Circulation**, and scientists describe it as a giant ocean conveyor belt that moves water from Greenland south to beyond the tip of Africa and into the Indian Ocean.

Warm, salty water near the surface moves north and mixes with cold, fresher water near Greenland. As that water cools and sinks it drives a slow circulation of the oceans that is critical to global climate, affecting the location of droughts and frequency of hurricanes. It also stores heat-trapping carbon dioxide deep in the ocean. The faster it moves, the more warm water gets sent into the depths to cool.

The area where warm water turns over in the North Atlantic is considered to be the engine of the conveyor belt. Scientists thought it was in the Labrador Sea west of Greenland.

But then a new international science team measured temperature, saltiness and the speed of ocean currents throughout the North Atlantic to try to better understand the conveyor belt. The preliminary results after hundreds of measurements in 21 months found that engine was several hundreds of miles east of where they figured. The study, published in Science, puts it east of Greenland, closer to Scotland.

The computer simulations that predict how the climate could change in coming years didn't factor in exactly where the conveyor belt engine is, and now they may be able to.

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2. Interim Budget 2019: Not really bullish on native cow breeds

Goyal bumps up revised budget for RashtriyaGokul Mission, slashes it for 2019-20

Union Finance Minister PiyushGoyal has allotted 750 crore to the RashtriyaGokul Mission (RGM) under revised estimates for the financial year 2018-19.

In the Budget presented last year, the **RGM, managed by the Department of Animal Health and Husbandry (DAHD)**, had been allocated 301.5 crore.

But intriguingly, even as he doubled the allocation for 2018-19, Mr. Goyal slashed the outlay for 2019-20, down to 302 crore, comparable to the amount originally allocated last year. Budget documents reveal that the DAHD only managed to spend 187.73 crore under the scheme in 2017-18.

'Superior' breeds

The RGM was launched in December 2014 on an outlay of 500 crore (2014-15 to 2016-2017) for developing and conserving indigenous breeds through selective breeding and genetically upgrading 'nondescript' bovine population.

The RGM aims to develop 'Gokul Gram' cattle care centres for indigenous breeds of high "genetic merit" as well as breeds that aren't as gifted.

The objective is to get native breeds to produce more milk, be more fecund, and to raise the quality of Indian cows and bulls to eventually outpace Jerseys and Holsteins.

The RGM doesn't address the issue of cattle past their reproductive or useful age. The government, in 2017, banned cattle slaughter, making it difficult for farmers to send away aged cattle. This raised stray cattle numbers. Although the ban was lifted later, the threat of vigilante violence has hit farmers.

RashtriyaGokul Mission:

Ministry/Department: Ministry of Agriculture & Farmers Welfare

Aim is conservation and development of indigenous breeds in a focused and scientific manner.

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Features of the Scheme:

- It is a project under National Programme for Bovine Breeding and Dairy Development.
- The objectives of this mission includes Conservation of indigenous breeds and their development to improve their genetic makeup, enhancing the milk productivity and distribution of disease free high genetic merit bulls for natural service.
- RashtriyaGokul Mission is being implemented through "State Implementing Agencies (SIA) viz Livestock Development Boards.
- Scheme is implemented on 100% grant-in-aid basis and throughout the country.
- It includes:
    - Establishment of Integrated Indigenous cattle centres "Gokul Gram".
    - Establishment of Breeder's societies "GopalanSangh".
    - Award to Farmers "GopalRatna" and Breeders' societies "Kamadhenu".
    - Assistance to institution which are repositories of best germplasm.

3. GM chickens may lay 'cheaper medicines

Therapeutic proteins are encoded in the bird's DNA and produced as part of the egg white

Genetically modified chickens that produce human proteins in their eggs can offer a cost-effective method of manufacturing drugs widely used for treating cancer and other diseases.

The research, which initially focused on producing high quality proteins for use in scientific research, found the drugs work at least as well as the same proteins produced using existing methods.

'No adverse affect'

High quantities of the proteins can be recovered from each egg using a simple purification system and there are no adverse effects on the chickens themselves, which lay eggs as normal.

The findings, published in the journal BMC Biotechnology, provide sound evidence for using chickens as a cheap method of producing high quality drugs for use in research studies and, potentially one day, in patients.

Eggs are already used for growing viruses that are used as vaccines, such as the flu jab.

Anti-cancer drug

This new approach is different because the therapeutic proteins are encoded in the chicken's DNA and produced as part of the egg white.

The team have initially focused on two proteins that are essential to the

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immune system and have therapeutic potential — a human protein called **IFNalpha2a**, which has powerful antiviral and anti-cancer effects, and the human and pig versions of a protein called **macrophage-CSF,** which is being developed as a therapy that stimulates damaged tissues to repair themselves.

Just three eggs were enough to produce a clinically relevant dose of the drug. As chickens can lay up to 300 eggs per year, researchers say their approach could be more cost-effective than other production methods for some important drugs.

Protein-based drugs, which include antibody therapies such as **Avastin and Herceptin**, are widely used for treating cancer and other diseases.

For some of these proteins, the only way to produce them with sufficient quality involves mammalian cell culture techniques, which are expensive and have low yields. Other methods require complex purification systems and additional processing techniques, which raise costs. The approach is efficient and produces better yields.

4. Power plants

Forage in your backyard for these three herbs that give store-bought superfoods a run for their money

Here are three plants, and how you can incorporate them in your daily diet.

Disclaimer: When using a plant as medicine, one needs to know how to prepare it, the dosage, way of intake or application. So seek the help of a naturopath. If sourcing from the garden or in the wild, make sure they are not subjected to chemical fertilisers, pesticides or polluted water.

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1. Globe Amaranth

Scientific name: Gomphrenaglobose

Season: November/December until May

Best for: Treating hypertension andbronchial problems

A common plant (that originated in Central America) growing in our gardens and sometimes in the wild, it has wonderful local names:rakthamallika(Sanskrit),gul-e-makhmal(Hindi/Urdu),vadamalli(Tamil),rudraakshi(Telugu),mahaasahe(Kannada), andwadapu(Malayalam).

The button-shaped flowers can easily be picked and preserved to use as a tea to treat bronchial issues and the edible leaves can treat hypertension.

Medicinal Values

Globe Amaranth is rich in antioxidant, anti-microbial properties and also has cytotoxins that fight cancer. Its cousin, the Prostrate Globe-Amaranth (Gomphrenaserrata), has properties to fight against microbes, bacteria and also Plasmodium falciparum , the parasite that can cause cerebral malaria in humans. The flower has a rich red-purple shade, making it an excellent alternative natural dye for food such as ice-creams.

2. Hogweed

Scientific name: Boerhaviadiffusa

Season: Perennial

Best for: Treating pain, inflammation, protecting the kidney and liver

Punarnava,as it is commonly known in Sanskrit/ Hindi (mukkarattaikireiin Tamil,ambatimaduin Telugu,adakaputtanagidain Kannada andtalutamain Malayalam), is a well-known ingredient in Ayurveda, Siddha, and Unani medicine.

Although it has tiny pink flowers, it is often confused with Horse Purslane(Trianthemaportulacastrum), an annual herb that looks more succulent and has white flowers. The good news is both are edible, either raw or cooked. Hogweed is antioxidant, anti-diabetic, anti-inflammatory, diuretic, treats indigestion, and obesity. It is known to be effective against acetaminophen (a common pain killer) -induced liver damage. In addition to these properties, the plant relieves pain and prevents cancer.

3. Diamond Flower

Scientific name: Hedyotiscorymbosa syn oldenlandiacorymbosa

Season: After the rains

Best for: Protecting the liver, detoxing and purifying

The tiny white four-petalled flowers that look like little stars growing among pointy greenleaves? These are both edible and medicinal.

Found throughout the tropics, they have many Indian names:parpatah/ piringoin Sanskrit,daman papparin Hindi,parppatakamin Tamil/Maly-

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alam,vernnela-vemu inTelugu, andparpata-hulluin Kannada.

Its tender leaves or the entire plant (when young) can be cooked and eaten with other greens. When the plant is burnt and the ash mixed with water, the liquid can be used as a tenderizer while cooking other tough vegetables. Apart from being a digestive, the plant relieves gastric irritation, treats fever, rheumatism, nervous depression and is a good source of vitamin C. A green fabric dye can also be extracted from its roots after chemical treatment.

Note