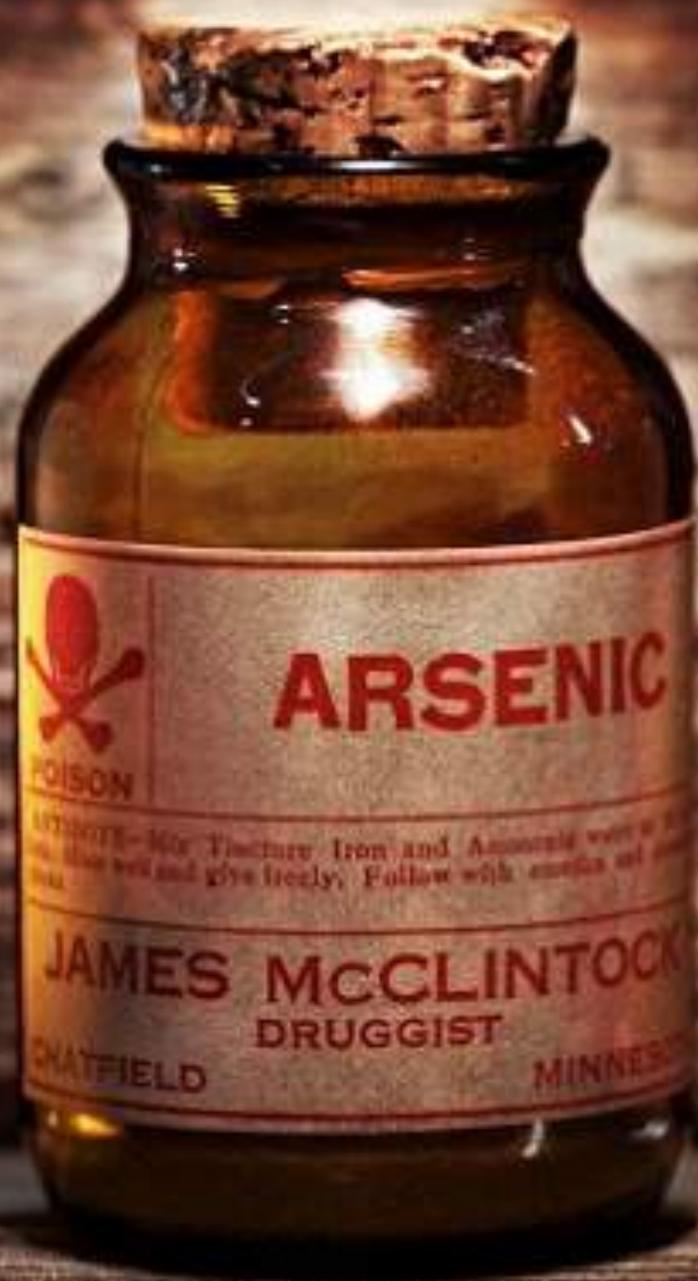


Arsenic-free rice

Herman Suhirman

Mighty Rice

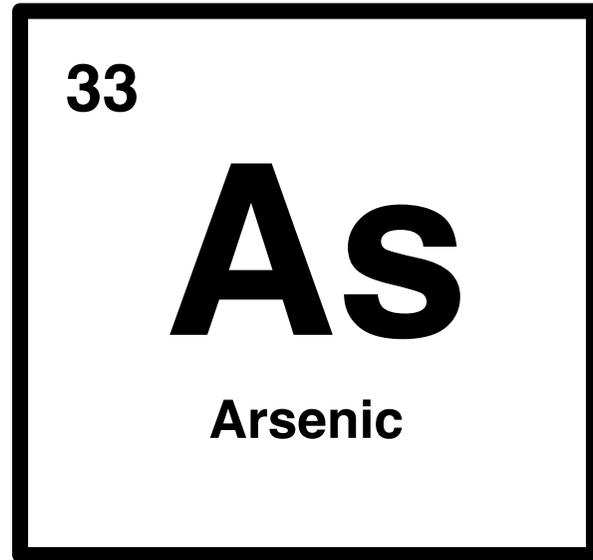
‘Arsenic’ conjures up an image of poison.



Arsenic

- To be clear, eating a packet of rice cakes is not the same as taking a deadly dose of the 19th century poison.
- It was only in the late 20th century that scientists began to detect arsenic in soil, water and food. Not at levels high enough to kill people outright but at the part per billion level.

What is arsenic?



Arsenic: Organic and Inorganic

- Naturally occurring element found in both soil and water.
- Atoms of arsenic bond with other elements to form molecules. If carbon is one of these elements, then the compound is an **organic** compound.
- If no carbon is present, then the compound is an **inorganic** compound.
- Inorganic arsenic = More toxic form. Linked with increased risks of cancer and other health effects.

European Union Limits: Inorganic Arsenic in Rice

- Maximum limits came into force on 1 January 2016

Non-parboiled milled rice (polished or white rice)	0.20 mg/kg (200 ppb)
Parboiled rice and husked rice (brown rice)	250 ppb
Rice waffles, rice wafers, rice crackers and rice cakes	300 ppb
Rice destined for the production of food for infants and young children	100 ppb

Where does the arsenic come from and how does it end up in rice?

How does arsenic end up in rice?

- Rice is a very efficient vacuum for pulling metallic elements out of the soil.
- Researchers say that the plant is at least ten times as effective as other grains at sucking up Arsenic from soil and water. It has a particular affinity to inorganic arsenic.

How does arsenic end up in rice?

Geographical Location

Arsenic is naturally occurring in soil and water. Some geographical locations naturally have more arsenic than other locations.

Anaerobic Growing Conditions

Studies indicate that growing rice on flooded fields dramatically increases the amount of arsenic rice plants absorb because the anaerobic condition keeps inorganic arsenic in a more mobile oxidation state.

Historical Use of Arsenic-based Pesticides

In the early 20th century, many popular pesticides were arsenic compounds. As a result, some fields may contain arsenic residue.



How does arsenic end up in rice?

Genes

Certain varieties of rice absorb more arsenic.

Fertiliser: Use of Poultry Manure

In some parts of the world, in the poultry industry, chickens are being fed arsenical drugs to promote growth and to kill intestinal parasites. Consequently their manure, which is often used to fertilize fields, can be high in arsenic.

Does organic rice contain arsenic?

Yes. There is no difference between conventional and organic rice when it comes to arsenic.

How do we grow arsenic-free rice?

 GLOBAL CONTROL		Eurofins Global Control GmbH Neuländer Kamp 1 D-21079 Hamburg GERMANY Tel: +49 40 49294 3450 Fax: +49 40 49294 3456 globalesupport@eurofins.de www.eurofins.de
Eurofins Global Control GmbH - Neuländer Kamp 1 - D-21079 Hamburg Vita Rice Limited attn. Mr. Herman Suhiman Level 6 Ken Lee Building 20 Edith Cavell Street Port Louis MAURITIUS	Person in charge Mrs. A. Grote ASM Mrs. A. Grote	Report date 06.01.2016 Page 1/2
Analytical report AR-16-FJ-000154-01		
Sample Code 716-2016-00000208		

JCHRD Arsenic (As)

Method EN 15763:2009, CON-PV 01274, ICP-HRMS

Subcontracted to a Eurofins laboratory accredited for this test.

Arsenic (As)

< 1

* µg/kg

JCHRD Arsenic (As) Method EN 15763:2009, CON-PV 01274, ICP-HRMS Subcontracted to a Eurofins laboratory accredited for this test. Arsenic (As)	< 1	* µg/kg
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The results of examination refer exclusively to the checked samples.
 Qualitative - tests in parts - must be authorized by the test laboratory in written form.
 Eurofins Global Control GmbH - Neuländer Kamp 1 - D-21079 Hamburg
 Place of execution and place of production: Hamburg - Street: Central Court Hamburg 40411714
 General Manager: Dr. Helmut Knaack, Dr. Manfred Lohndorfer
 VET No.: 1301464846
 Institut für Nahrungsmittel-Laboranalyse 198680000 (01.2.2005) (01) BIAN (24.03.2010) (01) 198680000 / 198680000 / 198680000 / 198680000
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 http://www.eurofins.de/infocenter/faq/faq.html, apply.



Location.



Growing arsenic-free rice

Location

- We commenced rice production on the island of **Mauritius** in 2009.
- Before us, rice had only been grown on an experimental basis on a small plot in the late 1970s.
- Until now, we are the only rice growers in the country.
- Mauritius naturally has lower levels of arsenic in its soil and water compared to other areas of the world.

Due to the porosity of the soil, and the hilly terrain we cannot flood irrigate.



We do not use ground water. We depend on rainfall for irrigation.



Growing rice using conventional flood irrigation requires up to 3,500 liters of water to produce 1 kg of rice. This is not sustainable.





All our rice is currently grown in rotation with sugar cane. The Mauritian sugar cane industry is facing a downturn due to the end of the EU Sugar Protocol. Rice production is providing them a lifeline.

Premium rice points to solution for Mauritius

RIVIÈRE DES ANGUILES, MAURITIUS

Commercial farms curb dependence on sugar with high-end offerings

BY CHRISTOPHER F. SCHUETZE

In tropical Mauritius, where the change of seasons is muted, the blooming sugar cane flower is a sure indicator of the beginning of another autumn.

The sugar cane and its seasonal fireworks — a sudden explosion of dusty color just above the 3-meter-high, or 10-foot-high, cane — have been a big part of island life since the 17th century. Dutch colonizers started growing sugar cane for the production of arrack, a strong, clear, distilled liquor they had discovered in Southeast Asia.

Sugar became the island's biggest industry — first as raw material for distillers, then as a commodity shipped around the world. Even into the 1970s, sugar represented roughly 95 percent of Mauritian gross domestic product, and cane was grown on a third of the island's land.

But fierce global competition, the rise of new cane-growing superpowers — China, Pakistan and Brazil — and waning preferred treatment from the European market have taken their toll on sugar prices. Although still grown on about a fourth of the island, sugar this year will represent only about 1 percent of the island's G.D.P.

This perfect storm is leading sugar cane farmers here to look for ways to shore up their income, and their future. While some smaller farmers have simply abandoned their land, larger commercial farms are starting to look for alternatives — from tourism to real estate sales to, increasingly, higher-value crops that can be sold around the world at premium prices.

"No one is talking about giving up sugar," said Michael Teig Rountree, who runs Bel Air, a 390-hectare, or 965-acre, sugar farm that has been in his family since his ancestors emigrated from Ireland in the early 19th century.

"Sugar cane has had its ups and downs. But it's quite different this time."

Having tried livestock feeds like alfalfa, soybeans and corn, Mr. Rountree, whose farm sits on the lush southern side of the island, stumbled on something promising: a premium rice, destined for health-conscious and well-off consumers in Europe and the United States.

While Mighty Rice, as it is called, was developed by cross-pollination in Bangladesh, its slick black-and-white packaging exalts the volcanic soil and rain-fed streams of Mauritius — marketing the benefits of the place it is grown as much as the food.

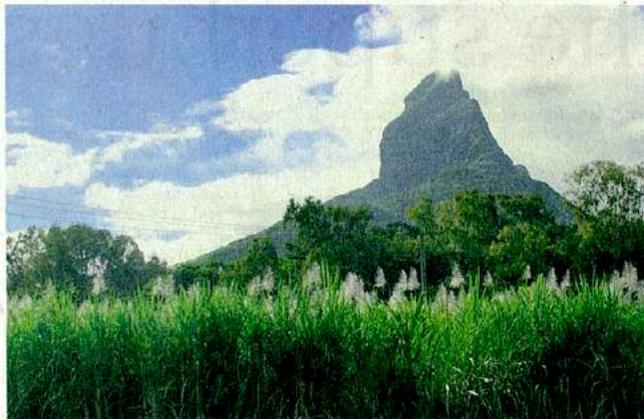
The rice, which is grown on dry land and so can be easily integrated into traditional farms, yields between four and six tons per hectare at a fixed price to farmers of \$800 per ton, earning them as much as \$4,800 per hectare. Sugar, by contrast, has an average yield of eight tons per hectare. At this year's price of \$360 a ton, that comes to \$2,880 per hectare.

The retail price for Mighty Rice is higher as well. On the shelves of the California supermarket chain Raley's, a 15-ounce bag sells for \$4.99, which is seven to eight times more than the price for the same quantity of white cane sugar in the same store.

"When we started growing rice here, the people thought we were insane," said Herman Suhirman of Vita Rice, a Mauritian company that started growing Mighty Rice in 2009 on its own 400-hectare farm, which was formerly the site of a state-owned sugar farm. This year's harvest will be his third to be available commercially, and already there are early signs of success. The company has produced 1,470 tons of rice in one year and is poised to sell some 40,000 15-ounce bags in the United States — so far its main export market.

The rice carries a certification guaranteeing that it is not genetically modified and free of arsenic — the latter a potential contaminant in other commercially available rice.

While the rice is not yet certified as organic, Mauritian rice farmers are taking no chances, fertilizing their fields with molasses to avoid anything that could affect the end product.



PHOTOGRAPHS BY CHRISTOPHER F. SCHUETZE

Moving up the value chain

Michael Teig Rountree, above, has started growing Mighty Rice on his sugar plantation. At top, a sugar field owned by Medine, whose diversification efforts include growing vegetables for local consumption.

"We are looking for soft options" for pest control and fertilization, said Bill Hoare, an Australian who runs Vita Rice's rice farm. "It's cheaper and it's better for the rice."

Premium rice is just one of the products farmers around the world are using to replace commodity crops, said Luis A. Ribera, a professor in the Department of Agriculture at Texas A&M

University. The state of Tamaulipas in Mexico, for example, has all but abandoned dry hay, corn and other row crops for irrigated vegetables destined for supermarket shelves in the United States. In some cases vegetables replacing row crops or cane in Central and South America are grown organically and sold at a premium.

"As crop land is reducing, population

is increasing and purchasing power from both developed and developing countries is on the rise, more and more emphasis is given to demand-driven production," Mr. Ribera wrote in an email.

Sophie Desvaux de Marigny, the head of communication at Medine, once one of the largest commercial sugar plantations in Mauritius, agreed. When a case brought to the World Trade Organization in 2004 first threatened the guaranteed price of Mauritian sugar on the European market, Medine, which owns farmland covering 5 percent of the island, decided to revamp its business, establishing separate property and leisure clusters and detailing a 25-year master plan.

Although Medine's sugar and rum are still exported — the company is even actively reclaiming fallow land to expand its agriculture division — it now grows vegetables for local consumption, rents out office space, runs a resort village and attracts international tourists to its nature safari park.

"At this point you want to produce something value-added," Ms. Desvaux de Marigny said.

The Mauritius Sugar Syndicate, which represents local sugar growers and millers abroad, has invested in marketing so-called special sugars — various shades and grain sizes of brown cane sugar — that can be sold directly to consumers and commands a premium price.

Lately the syndicate has been promoting Fairtrade sugar, of which it hopes to export 40,000 tons next year, a little less than 10 percent of all Mauritian sugar sold abroad. "The next phase is going to be all about sustainability," said Devesh Dukhira, who runs the syndicate.

Now in his second year of growing Mighty Rice, Mr. Rountree has planted about 63 hectares of the crop on his farm. The rice, which stands no taller than half a meter when fully mature, is dwarfed by the surrounding cane, but it allows the passer-by to look out past the field to palm trees, mountains and the light-blue Indian Ocean.

Remarking how nice such a view must appear to tourists, Mr. Rountree said: "It's almost as if the rice is a solution for problems we didn't even know we had."



Farming and harvesting is 100% mechanical.







Thank you

**mighty
rice®**