

A STUDY ON “USE OF EDIBLE CUTLERIES IN HOTELS & STREET FOOD STALLS”

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INTRODUCTION

Eat with it and then Eat it

This edible cutlery is a perfect alternative to harmful plastic cutlery, it is not only environmentally safe but also enriched with nutritious ingredients. Bakeys (sometimes also known as Bakey's) is an Indian edible cutlery manufacturing startup company based in Hyderabad, Telangana. Bakeys was founded in 2010 by former ICRISAT researcher Narayana Peesapaty as an eco-friendly alternative to disposable utensils prepared with plastic, wood and bamboo, such as bamboo chopsticks. Bakers use different types of flours to bake single-use edible spoons, forks and chopsticks which can be consumed after their intended use. Since 2010, it has sold more than 1.5 million pieces of cutlery throughout India. As of April 2016, the company only markets edible spoons, but has plans to expand its operations to begin distribution of forks and chopsticks with income from a Kick starter funding campaign. As of April 2016, the company only ships its products within India. The products are vegetarian, and are manufactured using with all-natural ingredients, (primarily sorghum (jowar), and other types of flours such as wheat, rice, and millet. The spoons have a shelf-life of 24 months and are so made that they will naturally decompose between 3 and 7 days after use if not consumed. The spoons are manufactured in several flavours, such as cumin, mint-ginger, carrot-beetroot and sugar.

Why is plastic bad for your health?

Plastic consists of many chemical components which are toxic and carcinogenic, and can leech into food. Narayana, who has been to several manufacturing units of plastic cutlery in the country, has observed that the way in which it is manufactured is not very safe for use with food.

In this very competitive market, he says, hygiene has become the first casualty of cost cutting. The process of cleaning the cutlery by manufacturing units in India that he visited, involved just a rag of cloth being used to wipe the final products that came out of the mould in which molten plastic was injected.

Why edible cutlery could be good for you?

- Edible cutlery is made of food materials and they come with nutritive contents.
- Edible cutlery contains no chemicals, additives or even preservatives. They are 100% natural and baked products.
- Edible cutlery falls under food category and hence, hygiene is of paramount importance.
- Edible cutlery cannot be reused. These are baked at high temperatures; therefore, the likelihood of microbial spores to survive is very little. Even if these micro-spores land after production, they are not likely to germinate because, the products are dehydrated (which is why they have long shelf life, even without preservatives). Moisture is essential for life to germinate/generate

These disintegrate in less than a week, unless stray animals and insects do not eat them up sooner

Aim – A study on use of edible cutleries in hotel & street food.

Objectives

- 1) To stop the use of plastic cutleries in hotel & street food.
- 2) To Minimize The Manpower.
- 3) To study feasibility of edible cutleries.
- 4) To make health benefits to the customers.

REVIEW OF LITERATURE

Plastic waste covers our oceans and landfill. The past 70 years of plastic waste have resulted in pollution so ubiquitous scientists say it's a marker of a new geological epoch, the manmade Anthropogenic.

Plastic cutlery is a contributor to this enormous problem – estimates suggest the US alone uses 40bn plastic utensils a year but the founder of Indian cutlery company Bakeys thinks he might have a solution. Cutlery you can eat. The vegan friendly spoons are made from rice, wheat and sorghum, an ancient grain originally from Africa. Sorghum was chosen as a primary ingredient for its tough quality (it doesn't go soggy in liquids) and because it is suitable for cultivation in semi-arid areas. The cutlery comes in three flavours – savoury (salt and cumin), sweet (sugar) and plain. "It tastes like a cracker, a dry cracker because we don't put any fat in it. It can complement any food. The taste of the food gets into the spoon," says company founder Narayana Peesapaty.

Bakeys' crowdfunding campaign on Kickstarter had a goal of \$20,000 (£14,000) but has already raised 12 times that. A parallel campaign on Indian platform Ketto has exceeded its 100,000 rupee (£1,050) goal 24 times over.

Peesapaty says he has had emails pouring in from around the world. "It is so simple and it is this simplicity that has caught the attention of most people," he says. With a background in forest management, Peesapaty previously worked at the International Water Management Institute's crop research centre and says he wanted to use a raw material that won't put much pressure on water resources. Even if the spoons are dumped after use, they decompose in a few days, according to the company.

Bakeys says this makes its product more environmentally friendly than biodegradable plastic utensils made from corn plastic, which need to be subjected to high heat in specialised composting facilities to break down. The spoons are packaged in paper bags and shipped using styrofoam to prevent breakage. Peesapaty acknowledges this is the least sustainable part of the operation and is looking for alternatives. Although the edible cutlery has only just found a following – a recent Facebook video with Peesapaty has had more than 5m views – Bakeys has been making spoons at its factory in Hyderabad, India, since 2011, where it employs nine women. It sells 1.5m spoons per year to catering companies serving food at weddings and other events, but Peesapaty hopes take-up among food vendors will grow. There are challenges. While Peesapaty hopes to expand Bakeys' offering to edible chopsticks and forks, edible knives are out as moisture blunts them. The biggest hurdle is probably cost.

Bakeys can sell an edible spoon for 2 rupees (2p), cheaper than the wooden equivalent but twice the price of a plastic spoon. Peesapaty's goal is to get the cost of a spoon down to 1.5 or 1 rupees. He hopes to do this by sourcing crops directly from farmers and building an economy of scale by adding new production lines with the investment raised online. If one examines any pile of trash, it will be seen that one of the major components in it is disposable stuff; and amongst this category, plastic cutlery's contribution is quite substantial.

Bakeys is launching the world's first edible cutlery line made of three flours: rice, wheat, and sorghum. Help us change the way we eat and think about waste!

And we understand how important it is to be able to provide delicious cutlery that can be eaten by anyone. We are already fully vegan, preservative free, trans fat free, dairy free and operate on principals of fair trade. We have put a focus on bringing up the following certifications within the following year:

Our mission is to start a cutlery revolution. Currently, about 40 BILLION plastic utensils are used just within the United States within a year. Worldwide, this becomes a figure at 16 times this magnitude. A majority of these utensils are only used once and then discarded.

Compostable utensils made of corn may seem like an answer to the problem. But it turns out, a good percentage of corn based biodegradable utensils are thrown into landfills anyway, where they will remain for a very long time without degradation. Because these utensils need high heat and very specific conditions to properly degrade, many times their benefits are negated.

Of course, one may ask, why do we not just replace all our utensils with reusable cutlery. Ask yourself, is this possible in today's globalized world? Is it possible for the millions of fast food restaurants around the world to provide reusable cutlery for one of the many customers that come in for lunch?

Therefore, our goal is to provide a replacement for the current disposable utensils on the market. Our spoons are delicious, but if they are not consumed, they are able to degrade in any outside environment, as they do not have specific requirements for degradation. In a standard environment where the spoons are exposed to nature, they will degrade within 10 days or be eaten by other animals, similarly to a biscuit that may be thrown outdoors.

About Person Who Invented Edible Cutlery

Narayana Peesapati

“Whenever I travelled, I used to feel terribly guilty about using plastic cutlery because it created so much plastic waste. Why couldn’t we create an alternative?” asks 48-year-old Narayana Peesapati, the founder and Managing Director of Bakeys Food Private Limited. Today, he has found a way to replace plastic cutlery with edible cutlery.

Ok, so plastic is bad for the environment. Everyone knows that. But what’s wrong with not washing plastic cutlery and putting it in one’s mouth? Narayana says it is because we “abuse and misuse plastic; plastic should not be applied to food.” He has said as much in this talk, where he gives many reasons as to why plastic, especially cutlery, should be taken out of our lives. Some of these reasons have to do with the manufacturing process for plastic cutlery (explained further down) and others with hygiene.

Bakeys edible cutlery is made from a mix of jowar (sorghum), rice and wheat flour. The spoons and chopsticks do not get soggy if placed in water and food. They only soften after some time (10-15 minutes), and thus can be eaten easily at the end of the meal. Even if discarded, they decompose within five to six days, if not eaten by insects or rodents.

The idea about how to make the cutlery struck Narayana during a flight from Ahmedabad to Hyderabad, when he saw a passenger using a piece of Gujarati Khakra as a spoon to eat dessert.

Ingredients

Our ingredients are as simple with absolutely no preservatives. The lack of water, moisture, or fat in our product allows it to have a long shelf life without the need for extra preservatives. They include: sorghum flour, rice flour, and wheat flour. However, because we knead our dough through a certain method, our final product contains less than 10 ppm in gluten. Though we are not yet certified gluten free, we are working on it, and our ultimate goal is to create a formulation that requires absolutely no wheat.

Our first offering, the edible lunch spoon, goes perfect with ice cream, yogurt, and a variety of soups. The spoon itself does not degrade within liquids due to the presence of a large

quantity of sorghum, a hearty crop that is strong, abundant, and requires very little energy for cultivation.

India-based company Bakeys has started producing edible spoons to try and fight world-wide plastic waste from disposable cutlery. Not only eco-friendly, but also delicious! I don't know about you but I'm not big on plastic cups. Or plates. Or cutlery, for that matter. Even if they're not the 2 cent-a-dozen variety that manage to break even when confronted with a salad, I just don't like how food and drink from plastic containers tastes. Their main selling point is that they're dine-and-forget. And, as there's not one person alive excited to do the dishes, it's a pretty strong sales pitch. But this only means that we're throwing away an absurd amount of these things, some 7 million tonnes of plastic yearly from the USA alone, EPA estimates.

And I'd much rather eat my own plate than leave it laying around in a landfill for millions of years.

Narayana Peesapaty, founder of Bakeys, seems to feel the same way as I do on this topic. He was appalled to see India's diners throw away an estimated 120 billion plastic utensils each year. But instead of just writing about it, he actually started doing something about it — a very *delicious* something. Peesapaty developed a new type of single use spoon, one that you can eat after your meal. Made of millet, rice and wheat, Bakeys edible spoons are designed to last for up to 20 minutes in hot liquids, and come in several flavors: ginger-cinnamon, ginger-garlic, cumin, celery, black pepper, mint-ginger, and carrot-beet. There's also a sugar-only option if you're not looking to spice up your meal. They're completely vegan-friendly too, if that's your thing.

Ironically, this spoon might be the healthiest part of your meal if you're living in the United States. And come on, a spoon that you can eat with your food? How awesome an idea is that?! No wonder then that they're a huge success — Bakey has already sold more than 1.5 million spoons. Peesapaty launched a Kickstarter campaign to expand the brand worldwide which received overwhelming support. From a 20,000\$ goal, they raised more than \$106,000 as of writing this article. And there's more than two weeks to go.

Because Bakey is already manufacturing the spoons for sale in India, the company is promising a reward of 100 spoons in the flavor of your choice for every pledge of \$10. The

funds will go toward expanding current operations and increasing production. A new facility is already under construction that will turn out more than 800,000 of the edible spoons each day and the company plans to expand to other utensils within a few months.

While the spoons are a great alternative for domestic use, Pessapaty says he's really after large commercial customers, where his tasty utensils can really make a dent in worldwide plastic waste.

Pessapaty, an agriculture researcher from Hyderabad, India, hopes that his edible cutlery will cut down on waste.

The world consumes about 110 million tons of plastic a year, most of which ends up in a landfill, according to the United Nations Environmental Program. Most plastic utensils are neither recyclable nor biodegradable. This means that after you use a plastic fork for 10 minutes, it eventually travels to a landfill where it sits for up to 1,000 years.

If it doesn't end up in a landfill, it ends up in an ocean — India ranks as #12 in the top countries that dump plastic into oceans, according to a 2015 study. Bakey's wants to make a dent in that waste. The company currently only ships within India, but plans to distribute internationally soon. The spoons, which come in packages of 100, cost about \$4.15. He aims to sell them mostly to takeout restaurants and food trucks, which largely use plastic utensils.

Another Kickstarter, the Edible Spoon Maker, makes spoons out of any dough at home, but it only creates a few at a time. There's also Foodie Spoon, but its edible utensils cost \$55 for a set of 100.

Although the Bakey's Kickstarter is over 600% funded (it has raised more than \$120,000), Pessapaty realizes his team will need to lower the spoons' price even more to compete with plastic cutlery. He hopes to cut the price in half.

"I realized my main competition was plastic spoons because they were cheap," he says. "If demand increases, prices will come down further."

Why edible cutlery? What is wrong with plastic disposables? Disturbing facts you must know:

WHY YOU SHOULD NOT USE PLASTIC?	HOW EDIBLE CUTLERY IS BETTER
<p>Plastic contains several chemical complexes that leach into food. Many of these are carcinogenic and neuro-toxic. The increasing trends in cancer incidences across the world is due to excessive exposure to plastic in form of packaging in food industry (e.g.: milk pouches) and plastic disposable cutlery before using it. Thus, would be actually licking this industrial contamination.</p>	<p>Edible cutlery is made of food materials and they come with nutritive contents.</p>
<p>The food law all over the world is silent on how hygienic the utensils should be. These fall under industrial production law.</p>	<p>Edible cutlery contains no chemicals, additives or even preservatives. They are 100% natural and baked products.</p>
<p>The food laws all over the world is silent on how hygienic the utensils should be. These fall under industrial production laws.</p>	<p>Edible cutlery falls under food category and hence, hygiene is of paramount importance.</p>
<p>The character of plastic does not change even after several times use. Therefore, there is a high opportunity for the unscrupulous food vendors to pocket more profits by putting the cutlery to unhygienic reuse. This time, the user would be susceptible to licking bacteriological contamination.</p> <p>Please remember, there is no law that prohibits reuse of cutlery and the law is also silent on the hygiene standards for the utensils to serve food</p>	<p>Edible cutlery cannot be reused. These are baked at high temperatures; therefore, the likelihood of microbial spores to survive is very little. Even if these micro-spores land after production, they are not likely to germinate because, the products are dehydrated (which is why they have long shelf life, even without preservatives). Moisture is essential for life to germinate/generate</p>
<p>When and if thrown away, plastic cutlery adds to the mounting non-degradable material garbage</p>	<p>These disintegrate in less than a week, unless stray animals and insects do not eat them up sooner.</p>

How to make Edible Cutlery

We make our cutlery with dough made from a mixture of sorghum, rice and wheat flours, kneaded with hot water. No preservatives, chemicals, additives, colouring agents, raising agents, fat, trans fat, artificial chemical nutrition or animal ingredients, milk or milk products are added. These are baked to make them crisp, hard and moisture free. These are 100% natural products, 100% vegan, 100% degradable (if you choose not eat them).

Since these are made with flours, we have the advantage of adding tastes and flavours. Basically, there would be three tastes- plain, sweet and savoury. In the sweet version, we have the choices of making vanilla, strawberry and other flavours. In the savoury version, we have the choices of salt and pepper combination (1) with added Indian spices and (2) with no additional spices added. In the sweet version, we would come with vanilla and strawberry flavours.

The edible cutlery is not just utility products....They are fun to use!

Research methodology

- Descriptive
- Analytical

DATA COLLECTION

Primary Data: Primary data is collected through the primary sources i.e., available facts and figures.

Secondary Data: Secondary data is collected through Journals, Magazines, Newspapers etc.

Data analysis

The data is analysed with the help of available facts and figure based on the impact of plastic on environment. On the basis of analysis it was found that we have to make serious efforts towards alternative of plastic cutlery. To achieve long time beneficiary facility. We have to take proper action to save the healthy environment.

Conclusion

From the research analysis, it is found that people in Nagpur city are not more aware about the edible cutlery. Most of the people having street food outlet still using plastic cutlery, but after analysis it is found that edible cutlery got the good responses from the people, as it is tasty, fun, nutritious & environment friendly. And where plastic is 'Non- Biodegradable', dangerous to human health & environmental pollution.

Suggestions & recommendations

- As Nagpur is a metro city and our prime minister is also announced to eliminate all single-use plastics in the nation by 2022, so we should be a part of this mission by avoiding the use of plastic cutlery and instead of plastic use edible cutlery, which gives fun, nutrients & taste.
- Nagpur should open the manufacturing unit of edible cutlery in the city.
- As the shelf life of edible cutlery is 24 months, so no need to worry about the expiry in bulk production.
- And the use of plastic cutlery in the Nagpur city will be zero & human health will be safe.

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