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This former banker claims Putin runs Russia like a crime syndicate. He should know: corrupt officials seized his assets and stole \$230m. His lawyer was beaten to death in jail. And now sinister text messages warn he might be next ...

Bill Browder tells Luke Harding why he's taking on the regime

Seven metal teaspoons are set out on a table in front of me, neatly lined up on a white napkin, as if awaiting the arrival of Uri Geller, or a banquet consisting only of boiled eggs. Thankfully, neither of these scenarios turn out to be the case. I'm at the Science Museum, surrounded by experts in spoon science, here to enlighten me on the future of the most shapely member of the cutlery family, in advance of a forthcoming exhibition on the science of taste.

"My ambition is to make the best spoon in the world," says Zoe Laughlin, director of the Institute of Making, a research group at University College London, who made my seven-spoon place setting. "The first question is, what would it be made of?" As the gaggle of cutlery experts look on, it feels a little like I'm being inducted into a secret spoon society, or else I've wandered into an interview for *Private Eye*'s satirical column, *Me and My Spoon*.

It turns out that the seven spoons are all coated with different metals, from copper and chrome to zinc and tin, along with standard-issue stainless steel. "We realised there hasn't been much research into the taste of different metals," says Laughlin, "but it really effects how food tastes. If a metal makes something taste sweeter, or richer, then there's potential to reduce the sugar content in the food itself."

I reach for a spoon and plunge it into some yoghurt. The resulting mouthful tastes a bit fizzy, as if the yoghurt's gone off - the trademark tangy tingle of zinc. A second spoon gives a salty metallic kick - the steel - while chrome makes no difference at all. Sadly, there is no magnesium spoon; if you ever put an old school pencil sharpener on your tongue, during an idle moment in maths class, you'll know that it gives even more of a thrill than popping candy. (Or was that just me?)

In a blind tasting, Laughlin's guinea pigs found that copper and zinc were the sourest, while the spoon to end all spoons was, of course, made of gold. "Mango sorbet with a gold spoon is just heaven," she sighs. "Mango never tasted so mangoey." But too bad if you were born with a silver spoon in your mouth: in the blind tasting, it came out near the bottom.

It all has to do with the "reduction potential" of the different metals - the ease with which they oxidise - which effects how many atoms come off in your mouth. The relatively inert gold is best suited to subtle, creamy foods, Laughlin found when she put on a seven-course banquet with a Michelin-starred chef, because it



Zinc for fizz, steel for saltiness, gold for mango sorbet ... the right type of spoon can blow your tastebuds away, finds **Oliver Wainwright** as he wraps his chops round the future of cutlery design

The great spoon-off

'Taste sensations from the future' ... (above) Oliver Wainwright tests his metal; (below) Zoe Laughlin with her taste circuit

has the least metallic taste. Cod on a zinc spoon, on the other hand, was revolting. Time for Heston to appoint a spoon sommelier, perhaps?

Designer Andreas Fabian, who has a PhD on spoons, has his sights set on even higher levels of gastronomic indulgence. "Nowadays, the tactile experience of food is pretty much limited to what goes on in your mouth," he says, "but there is so much more to the sensual experience of dining."

He unravels a black pouch, containing a collection of oddly fetishistic implements, like the toolkit of an aesthete-torturer. There is a pair of golden tongs - half knife, half chopstick - and a silver-plated tuning fork, for pronging chunks of food with a twang, along with several glass wands with rounded, pendulous ends.

"This one is to replicate the pleasure of licking your finger," he says, inviting me to dip a gold-leafed

wand in a jar of warmed Nutella. Then there is a glass bowl covered in rabbit fur, designed to encourage a more tactile experience with your soup.

A third scientist waits patiently, fiddling with a circuit board that sports a rather alarming metal pincer. Before I know it, the tweezers are clamped around my tongue, and I'm being fed taste sensations of the future through an electric current.

"We realised that taste and smell are missing from the different senses we use to communicate," says Emma Zhang, a researcher at City University's Mixed Reality Lab. "You might be in France having a nice meal and fine wine, and want to share the taste with someone, but all you can do is send them a picture."

By varying the magnitude and frequency of the current, as well as the temperature of the conductors, Zhang and her team are working to simulate the five taste sensations of sweet, sour, salty, bitter and *umami*, the Japanese sense of a savoury taste. Cooling the conductor helps to imitate the effect of mint, while heating it up replicates spicy tastes. But the technology seems to have a way to go: I didn't get anything more than the feeling of a sour electric shock on the end of my tongue, as if I'd spent too long licking out the depths of a sherbet dip.

Still, Zhang is confident that it could take off with the world of social media, given the obsession with posting pictures of meals on Instagram. So forget Snapchat and selfie-sticks: phone-sucking could be the next frontier.

i Cravings: Can Your Food Control You? is at the Science Museum, London SW7, from 12 February. Details: sciencemuseum.org.uk

