

Celebrities and science 2010

Each year at Sense About Science we review the odd science claims people in the public eye have made – about diets, cancer, magnets, radiation and more – sent in to us by scientists and members of the public. Many of these claims promote theories, therapies and campaigns that make no scientific sense. We ask scientists to respond, to help the celebrities realise where they are going wrong and to help the public to make sense of celebrity claims.

WHAT'S NEW IN THE 2010 REVIEW?

This year, we have seen the biggest rise in dubious theories about how the body works, so we have included singer and actress **Olivia Newton-John**, who said that she takes digestive enzymes and plant tonics to boost her immune system. Other unusual ideas about boosting our bodily functions have prompted strange diets, from **Naomi Campbell's** maple syrup, lemon and pepper regime to Girls Aloud's **Sarah Harding** sprinkling charcoal over her meals.

In sport and fitness, cage fighter **Alex Reid** shared tips about preparing for a fight (he 'reabsorbs' his sperm). **David Beckham** and **Kate Middleton** have been spotted wearing a hologram-embedded silicone bracelet which claims to improve energy and fitness. And **Cheryl Cole** reputedly extolled a weight loss regime based on her blood group.

In health and disease, celebrity views about the causes of cancer retained the improvement seen in 2009, though actress **Joanna Lumley** and former Harrods owner **Mohamed Fayed** both get a mention.

And although we have noted far fewer claims about the benefits of 'chemical free' food this year, model **Gisele Bündchen** raised some old misconceptions as she joined the 'breast is best' baby feeding debate.

As always, the review notes people in the public eye who do make scientific sense. Reports of **Jennifer Aniston's** 'baby food diet' caused some raised eyebrows, so dietitians were glad to see her deny rumours that she follows the puréed food regime. Jennifer said: **"Sorry, but the last time I had baby food, I believe I was one. I've been on solids for about forty years now."**¹

To improve the outlook for 2011, we have distilled our scientists' responses into easy-to-remember pointers for celebrity commentators.

Two old chestnuts:

- **Nothing is chemical free:** everything is made of chemicals, it's just a case of which ones.
- **Detox is a marketing myth:** our body does it without pricey potions and detox diets.

Two new lessons from 2010:

- **There's no need to boost:** bodily functions occur without 'boosting'.
- **Energy and fitness come from... food and exercise:** there are no shortcuts.

At Sense About Science we receive many calls each year asking for help about scientific issues and we have thousands of scientists, from early career researchers to leading experts, on hand. Celebrities, remember – all it takes is a phone call:

Check the facts. Call Sense About Science on

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Sense About Science is a small charity that equips people to make sense of science and evidence.
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1. Physiology

Singer and actress **Olivia Newton-John** told newspapers that she takes **“digestive enzymes with every meal, and ‘Illumination’, a tonic containing South American plant extracts that helps boost [the] immune system.”**²

Dr Melita Gordon, consultant gastroenterologist, Royal Liverpool University Hospital:



All the digestive enzymes you need are produced in a beautifully co-ordinated way by different structures in your gut. They work best at the exact location where they are produced. Your body makes all the enzymes you need, in the right place, at the right time.

Dr Helen Lock, immunologist:



Your immune system cannot be ‘boosted’. As long as you are generally fit and well, the immune system is more than capable of fighting disease. Although it can be damaged, by smoking and stress for example, there is no clinical evidence that it can be improved.

A diet used by **Naomi Campbell, Ashton Kutcher** and **Demi Moore** this year is the ‘Master Cleanse’, where followers survive on maple syrup, lemon and pepper for up to two weeks with nothing else to eat. In an interview with Oprah Winfrey, Naomi Campbell explained: **“it’s good just to clean out your body once in a while.”**³

Ursula Arens, dietitian, British Dietetic Association:



But, Naomi, the body has many natural functions that eliminate substances which would be ‘toxic’ if allowed to accumulate. Most diets have no effect on the rate of these physiological functions and do not improve the quality of ‘cleansing’ in the body.

Anna Raymond, dietitian, British Dietetic Association:



Essentially it’s not cleaning your body – it’s starving it! A severe diet might actually lead to the creation of potentially harmful chemicals called ketones as a result of changes in your metabolism.

Pop star **Sarah Harding** told *Now* magazine that she crumbles charcoal over her food. She said: **“It doesn’t taste of anything and apparently absorbs all the bad, damaging stuff in the body.”**⁴

Dr John Emsley, chemical scientist and writer:



Charcoal is known to absorb toxic molecules when used in gas masks and in sewage treatment. However, it is unnecessary when it comes to diet because the body is already quite capable of removing any ‘bad, damaging stuff’ it encounters in ordinary consumption. It might help prevent any smelly farts though.

Juliet Stevens, junior doctor:



Well, Sarah, charcoal is useful for treating life-threatening poisonings and overdoses: in the stomach it binds directly with the dangerous substances, before they have a chance to be absorbed by the body. Luckily for us, the waste products that our cells produce aren’t harmful, and are easily removed by our kidneys and liver. And, it’s no use after the festive season either - it doesn’t bind with alcohol at all!

Cheryl Cole and **Cliff Richard** tried the blood type diet, which claims that people with different blood groups break down food in different ways, and should eat different things. In an interview with *Hello!* Cheryl said: **“It has made such a difference, not just to my shape, but to how I feel and my energy levels.”**⁵

Sian Porter, dietitian, British Dietetic Association:



Your blood group cannot affect digestion or the way food is broken down - this theory is really just another spin on reducing overall calorie intake. It is surprising that Cheryl feels her energy levels have improved as cutting out food groups can lead to flagging energy levels.

EASY-TO-REMEMBER POINTS

- **Detox is a marketing myth: our body does it without pricey potions and detox diets.**
- **There’s no need to boost: bodily functions occur without ‘boosting’.**

2. Sport and Fitness

Power Balance, a silicone bracelet embedded with a hologram, promises to improve strength, energy and flexibility. Celebrities sporting the bracelets have included **David Beckham, Robert de Niro, Kate Middleton** and even **Spanish Ministers of State**. Formula 1 driver **Rubens Barrichello** gave the bracelet his official endorsement, saying: **“It is amazing how I feel better, stronger and more flexible when I exercise.”**⁶

Professor Greg Whyte, sports scientist, Liverpool John Moores University:



Rubens should feel better, stronger and more flexible when he exercises! Over time physical training enhances oxygen transport and consumption, and increases muscle mass and range of motion. Any perceived

enhancement to his performance from wearing the Power Balance bracelet is likely to be a placebo effect, as he expects to feel a change.

American basketball player **Shaquille O’Neal** is also a huge fan of the bracelet, recounting the first time he wore the bracelet in a match: **“We won that game by 57 points!”**⁷

Michael Blastland, statistics writer and broadcaster:



People have their ups and downs. Sometimes the ups occur when they wear odd socks, sometimes a new bracelet. Give enough bracelets to enough people and some are bound to have a great day. That’s just chance.

And when you ask people to report the ups, it’s the ups that tend to be reported. That’s known as selection bias. So maybe it seems to be the bracelet that did it, Shaquille, but most likely it’s chance and selection.

Coronation Street actress **Kate Ford** used magnet therapy to help lose weight: **“I used Magnaslim... a magnet worn on my wrist’s acupuncture point, which stopped me anxiety eating, curbed cravings and helped me drop 2st in a few months.”**⁸

Edzard Ernst, Professor of Complementary Medicine, University of Exeter:



Kate, wearing the magnet might have helped to strengthen your resolve to lose weight but it is unlikely to have had much of an effect on your body beyond this. Other than a placebo effect, there is no evidence of any physical mechanism that

suggests magnets worn at wrist points can have any beneficial powers.

Cage fighter **Alex Reid** gave fans his tips on how to prepare for a match as he promoted his new fight show, *Alex Reid: The Fight of His Life*. He said: **“it’s actually very good for a man to have unprotected sex as long as he doesn’t ejaculate. Because I believe that all that semen has a lot of nutrition. A tablespoon of semen has your equivalent of steak eggs, lemons and oranges. I am reabsorbing it into my body and it makes me go raaaaahh.”**⁹

Professor John Aplin, reproductive research scientist, University of Manchester:



Alex, sperm can't be reabsorbed once they have formed in the testes! In fact sperm die after a few days, and the nutritional content of the ejaculate is really rather small. And it's worth remembering that

unprotected sex might result in pregnancy or the passing on of a sexually transmitted infection.

EASY-TO-REMEMBER POINT

- Energy and fitness come from... food and exercise: there are no shortcuts.

3. Medicine and Disease

In an interview in the *Daily Telegraph*, actress **Julia Sawalha** said: "I don't get inoculations or take anti-malaria tablets when I go abroad, I take the homeopathic alternative, called 'nosodes', and I'm the only one who never goes down with anything."¹⁰

Professor Jayne Lawrence, chief scientific advisor, Royal Pharmaceutical Society:



Julia has been fortunate in not getting malaria on her travels as there is no active ingredient in homeopathic treatments that would protect her against the disease.

Speaking at the launch of a chutney in aid of Gurkhas, actress **Joanna Lumley** said: "When I was young, I heard of one person who had cancer in all my growing up, a friend of my mother. So why have we got so much cancer? Could it be the growth hormones in the food we eat, that try to make all the chickens, sheep and cows, more productive?"¹¹

Marianne Baker, research student, Cancer Research UK:



Joanna, one reason cancer can seem more common than ever is due to improved detection and longer life expectancies. Incidence has actually changed very little in the last ten years, but there have been fewer cancer-related deaths due to earlier diagnosis and improved treatments.

Former Harrods owner **Mohamed Fayed** told a reporter about his objection to mobile phone masts: "How can the council allow mobile phone masts in very densely-populated areas? All that radiation - it causes cancer!"¹²

Dr Mireille Toledano, epidemiologist, Imperial College London:



There are many different types of radiation, Mohamed, existing on an electromagnetic spectrum that runs from high-energy ionising radiation (ultraviolet, x-rays and gamma rays) to low-energy non-ionising radiation (visible light, infrared, microwaves, and radio waves). Mobile phones and mobile phone masts work by transmitting non-ionising radio waves, and to date, there is no convincing evidence to associate this low-level radiation with an increased risk of cancers.

Anthony Davies, Emeritus Professor, electronic engineering, King's College London:



Ionising radiation, such as that from X-rays, can damage DNA. Although non-ionising radiation can cause heating (as in a microwave oven) the heating effect from a distant mobile phone mast is negligible and has not been shown to damage DNA.

4. Chemistry

In September's issue of *Harper's Bazaar* magazine, model **Gisele Bündchen** criticised women who don't breastfeed, saying: "I think 'Are you going to give chemical food to your child when they are so little?'"¹³

Stuart Jones, clinical scientist:



Gisele, there is no such thing as chemical-free food. Everything we eat is made of chemicals, no matter how it is produced or where it comes from, whether it is natural or man-made.

EASY-TO-REMEMBER POINT

▪ **Nothing is chemical free: everything is made of chemicals, it's just a case of which ones.**

What Next?

Celebrities... how will you fare in 2011? What diets or miracle cures might you be tempted to try? Before you stake your name on the latest diet or energy booster, consider the pointers in this review. And if you still find yourself confused or unsure, call the number on this leaflet.

If you are a scientist and want to help to get good science into public discussions, email:

enquiries@senseaboutscience.org

You can send us examples of celebrities speaking about science and medicine:

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1. *Metro*, Jennifer Aniston denies baby food diet claim, 15th May 2010

2. *Daily Mail*, Under the microscope: Olivia Newton-John, 1st June 2010

3. *Daily Mail*, Maple syrup, lemon juice and cayenne pepper: Naomi Campbell reveals the secret diet ingredients of her slimline figure, 6th May 2010

4. *Now*, Sarah Harding eats charcoal, 6th April 2010

5. *Hello!*, Cheryl Cole's slimming secret revealed, 4th May 2010

6. <http://www.powerbalance.com/canada/rubens-bar-richello>, 9th December 2010

7. *Guardian*, Sport's latest sensation – a rubbery bracelet, 2nd August 2010

8. *Fabulous*, *News of the World*, Coronation Street's Kate Ford, 32, on using magnets to lose her baby weight, 23rd May 2010

9. *The Sun*, Jord's man has bizarre sex ban, 8th April 2010

10. *Daily Telegraph*, Julia Sawalha's holiday heaven and hell, 7th January 2010

11. *Daily Mirror*, Joanna Lumley claims 'rises in cancer due to eating processed meat', 9th August 2010

12. *London Evening Standard*, Fayed is seeing red over mobile phone masts, 10th September 2010

13. *Daily Telegraph*, Supermodel Gisele Bündchen: breastfeeding should be made law, 2nd August 2010