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Purple Tomatoes – Biotech Gets Colorful

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Report Highlights:

News of a home-grown biotech product that could deliver potential consumer health benefits has been well-received in the UK. The UK has been at the forefront of primary research, funded by European and UK entities, to develop tomatoes with high levels of anthocyanins. These are deep red pigments with antioxidant capabilities thought to protect against a range of serious diseases. Recent surveys in Europe and the UK have shown that there is an increased understanding of the role that biotech crops could play in global food security. However, it is hoped that purple tomatoes and other “second generation” biotech products with tangible consumer benefits could encourage more consumers to accept GM.

Includes PSD Changes: No
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Purple Tomatoes – Biotech Gets Colorful

Background

The debate surrounding agricultural biotechnology continues to ebb and flow in the UK. However, there are signs that consumers are absorbing positive messages on biotechnology. A recent UK survey of 1,500 consumers¹ found that a substantial proportion believe biotech can provide benefits, particularly in helping to feed a growing world population. Although, food safety and environmental impacts associated with the technology remain of concern.

The UK government has been more pro-active of late in defending biotechnology as a tool needed by farmers to increase output to feed a growing global population. The government's relatively vocal stance is also influenced by awareness of the animal feed crisis that is potentially looming in Europe.

Purple Tomatoes

A UK research center has developed a biotech food product with potential consumer benefit. The John Innes Centre in Norwich, England², has developed purple tomatoes high in beneficial anthocyanins. The antioxidant properties of anthocyanins are thought to provide protection against a range of illnesses, including heart disease and cancer. In tests, cancer susceptible mice fed on a diet supplemented with high-anthocyanin tomatoes lived longer.

Anthocyanin pigments occur naturally in blueberries, blackberries and blackcurrants, but regular tomatoes contain negligible amounts. Market research from TNS shows only 12 per cent of the UK population meet the government target of 5 portions of fruit and vegetables per day. The purple tomato research is an exciting development as consumers are more likely to see and feel the benefit to using biotechnology in such food applications. The aim of being used to enrich food products widely and frequently consumed to deliver additional health benefits.

UK scientists worked in conjunction with peers from Italy, Germany and the Netherlands to produce high-anthocyanin tomatoes by inserting 2 genes from the snapdragon (*Antirrhinum*) plant into regular tomato plants. They also added promoter sections of DNA that give rise to high levels of anthocyanin pigments in the fruit, but allow plant leaves and stems to grow normally.

The research was funded under the EU's Fifth and Sixth Framework Programs (FP5 and FP6³), and by the UK's Biotechnology and Biological Sciences Research Council (BBSRC⁴). It was published online in the journal *Nature Biotechnology* on 26 October, 2008⁵.

¹ Institute of Grocery Distribution Consumer Survey on Genetically Modified Foods: [IGD Consumer Attitudes to GM Survey](#)

² The John Innes Centre is an independent, world-leading research center in plant and microbial sciences www.jic.ac.uk

³ EU funding was provided through two research projects that aim to explore the contribution bioactive compounds in food can make to improving health through diet:

a) ProFood <http://profood.ipk-gatersleben.de/>

b) FLORA <http://www.flora-flavonoids.eu/cms/>

⁴ The Biotechnology and Biological Sciences Research Council is the UK funding agency for research in the life sciences www.bbsrc.ac.uk

⁵ Nature Biotechnology doi: 10.1038/nbt.1506
<http://www.nature.com/nbt/journal/vaop/ncurrent/abs/nbt.1506.html>

Toxicological studies will need to be carried out to ensure that the snapdragon genes have not activated production of other, less beneficial, chemicals. However, the researchers believe that anthocyanins are unlikely to change the flavor of the tomatoes.

Analysis

The advent of purple tomatoes is unlikely to cause a seismic shift in UK consumer attitudes. However, the publicity surrounding their successful trial will be helpful in strengthening the more positive side of the biotech debate.