



When food and drink adulteration kills

Professor Tony Hines

A Leatherhead Food
Research white paper

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In this white paper, Professor Tony Hines argues that ‘horsegate’ changed the food industry forever on 15th January 2013. Before this, food fraud was an emerging and sometimes entertaining issue, but was not a major concern for mainstream food and beverage operators. Tony considers whether the industry has learned the lessons from horse meat substitution – could the industry face a similar case of adulteration which this time compromises food safety?

Our Leatherhead Food Safety Forums have long advised food professionals to ‘think like criminals’ to tackle intentional adulteration and substitution. On 15th January 2013, the ‘horsegate’ scandal (the inclusion of undisclosed horse meat in meat products) was a high profile case of food adulteration which required auditors, brand owners, governments, researchers, consultants, enforcement, the media and consumers to sit up, take note of and react to what appeared to be a wide spread issue in our food industry.

The reaction of the media in January 2013 was to report widely that ‘horsegate’ was a food safety issue as horses injected with Phenylbutazone (bute) may have entered the food chain. The Chief Medical Officer from the Food Standards Agency (FSA) was quick to point out that, while bute is now no longer given to humans, only small traces of the drug were present in some samples they tested and the maximum level of bute they found would have to be multiplied 1,000 times before it equated to the dosage level which used to be administered to humans. The FSA judged the risk to human health as very low.

Drug residues were, therefore, not considered a food safety risk but we did not know at the time the country of origin of the horse meat, where the horse meat contamination occurred and what the hygiene conditions at slaughter were, where it was deboned, minced, stored or how it was distributed. Food safety issues could not be immediately ruled out and consumers and brands had the right to expect food to be labelled correctly. The industry was in a state of shock.

In the end, the case of horse meat substitution was not shown to be an issue of safety. However, just because ‘horsegate’ didn’t have food safety implications, it doesn’t mean that the next food scandal won’t compromise food safety, and the consequences of this could be very serious indeed. A case study we regularly use in our crisis management workshops and lectures shows just how devastating food adulteration can be.

Case study: Spanish Toxic Oil Syndrome

In April 1981, food oil salesmen in the provinces in and around Madrid were selling cooking oil door-to-door in unlabelled 5-litre plastic containers. On the 1st May 1981 an

eight year old boy in Madrid was dying from acute pulmonary insufficiency. He was from a family of eight, six of whom were later to become ill. An explosive and abrupt epidemic was about to begin. Over the following two months over 10,000 hospital presentations were recorded with 80 deaths in the Madrid region. Over the next six months a further 2,600 presentations were recorded. The Minister of Health and Consumer Affairs in Spain was alerted to a potential causal relationship between the epidemic and the consumption of cooking oil. On 30th June 1981 the Minister announced a scheme to substitute 'for free' pure olive oil for suspect toxic cooking oil. This single act saw a sudden disappearance of further acute cases.

This disease occurred mainly in lower socio-economic groups and the poor. No cases occurred in children under six months old, 60% of reported cases were female and the highest incidence rate in men and women occurred between 31 and 60 years of age. The mortality in females was double that of males. At the end of 1983, over 20,000 people had been affected and 12,000 required hospital admission. By May 1983, 339 people had died; by 1992 that figure had increased to more than 800¹.

The unique clinical appearance of this disease separated it from any other known disease. Evidence indicated an environmental disease but the causal factor was unknown. Evidence eventually pointed towards ingestion of adulterated vegetable oil. The disease became

known as Spanish Toxic Oil Syndrome (TOS, for short)².

This adulteration incident prompted a large number of research projects to confirm the composition of numerous vegetable oils and importantly how to verify that they were not contaminated, diluted or adulterated. The investigators at the time were confident that the disaster was caused by imported rapeseed oil that was denatured with aniline for industrial use. It was then processed further for food use illegally but not all the aniline was removed. Several reports then suggest that the oil was further blended with animal fats and other vegetable oils such as low-grade olive, soya bean and grapeseed oil prior to sale. A number of minor components, such as flavours, were also added to give the appearance and smell of 'pure' olive oil before being sold³.

Food adulteration is an age old problem

Spanish Toxic Oil Syndrome is often regarded as the most devastating food poisoning incident in modern European history – modern history, because we know the Romans, 2000 years ago documented incidents of adulterated wine. During the early and mid-nineteenth century the Victorians became very adept at food fraud and substitution. Early food regulations to prevent death and illness were introduced and nearly 200 years later Enforcement Officers and Regulators around the world are still battling to keep our food and drink supply chains safe.

¹ Toxic Oli Syndrome, WHO, Current Knowledge and future perspectives, No 42 ISBN 92 890 1305 2

² Toxic Oli Syndrome, WHO, Mass food poisoning in Spain March 1983

³ September / October 1984, Nutrition and Food Science, Kochar & Rossell, both Leatherhead Food Research employees at the time

But if you think that these kinds of adulteration are a thing of history, then sadly you are wrong. Despite the food industry's ability to produce safe, wholesome food and drink, the opportunities for adulteration, copyright infringement and the production of 'fake' products remain a severe and well recognised problem.

The Leatherhead Food News Team reported on the 10th October 2016 that it has been estimated that as many as 10,000 Ukrainians die each year from drinking counterfeit alcohol. In September 2016 it was reported that over 50 people in the northern regions of the Ukraine died after drinking counterfeit vodka mixed with methyl alcohol, also known as methanol. Following a number of incidents, it has been observed that there has been an increase in the availability of fake alcohol from Russia, Indonesia, Turkey, the Czech Republic and others, which is sold at grocery shops for less than the normal retail price⁴.

Combating food fraud

In our training sessions and workshops, we regularly challenge companies to identify a food or drink product that could not be exposed to some form of adulteration, enhancement, dilution, substitution or misleading and false labelling claim.

Our advice to food manufacturers and retailers on how to combat food fraud is to open the toolbox available to you as members of Leatherhead Food Research. Within that toolbox, there are vulnerability assessments, there is the ability to audit, inspect and to conduct some end product testing.

The emergence of VACCP, Vulnerability Assessment Critical Control Point, to identify points of vulnerability within supply chains has been a development. Simply put, if you can identify a weakness, you need to introduce mitigation strategies to ensure you are no longer exposed to such vulnerabilities. This may involve a combination of creative thinking, asking deep, meaningful and probing questions within the supply chain, audits, analysis and mapping supply chains, price and political risk. Read more about VACCP in our white paper: [Knowing your HACCP from your TACCP and VACCP](#).

The expression 'what goes around comes around' is very relevant here. The horse meat scandals of the 1980s took 30 years to re-emerge. Old fraud favourites like Sudan 1, a carcinogenic textile dye, contamination have never been completely eradicated. In some parts of the supply chain we still see documented cases. The Sudan 1 incident, (2003-5) the largest product recall Europe has ever seen is now over 10 years old. It and other 'enhancers' like melamine will re-emerge in the future.

The food and beverage industry changed forever in January 2013. The excellent work by suppliers, manufactures and retailers, enforcement, regulatory and food industry professions has given large parts of the world a very safe food industry. Sentencing guidelines in the UK relating to health and safety offences, corporate manslaughter and food safety and hygiene offences which came into force in February 2016 are a reminder of

⁴ securindustry.com (7.10.2016)

how serious food adulteration offences are considered by the authorities.

We never want to see Spanish Toxic Oil Syndrome or any other intentional, fraudulent disaster relating to food and beverage consumption again. **We never want to see food and drink adulteration kill again!**

How Leatherhead can help

Contact safety@leatherheadfood.com to discuss any of your food and beverage safety needs. Our On-site Food Defence and or Food Fraud Training is very popular and can incorporate all aspects of TACCP, VACCP and Incident Management training. We can help you with desk based and on-site risk assessments on any safety related issues. We are able to help you with advice and guidance with your HACCP, TACCP and VACCP assessments, either by documentation review, or on-site assessments. We can also help you to troubleshoot microbiological problems.

About the author

Professor Tony Hines, MBE, FIFST, is the VP of Global Regulatory Services and Crisis Management at Leatherhead Food Research. Tony has been involved in incident management for over 25 years. He has extensive experience of food fraud and crisis management, dealing with serious, accidental and malicious food contamination issues. He is a fellow of the Institute of Food, Science & Technology and a trustee and former chairman of the Anaphylaxis Campaign.

About Leatherhead Food Research

Leatherhead Food Research provides expertise and support to the global food and drink sector with practical solutions that cover all stages of a product's life cycle from consumer insight, ingredient innovation and sensory testing to food safety consultancy and global regulatory advice. Leatherhead operates a membership programme which represents a who's who of the global food and drinks industry. Supporting all members and clients, large or small, Leatherhead provides consultancy and advice, as well as training, market news, published reports and bespoke projects. Alongside the Member support and project work, our world-renowned experts deliver cutting-edge research in areas that drive long term commercial benefit for the food and drink industry. Leatherhead Food Research is a trading name of Leatherhead Research Ltd, a Science Group Company.

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