



THE FOOD CHAIN



THE *safefood* KNOWLEDGE NETWORK NEWSLETTER

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WASTE NOT, WANT NOT



FoodCloud is a not-for-profit organisation, which aims to reduce food waste and restore community spirit based on the principle of shared food. Established in 2012, FoodCloud offers retailers the chance to reduce the cost of food waste in their stores, while supplying charities with unwanted food for consumption. Following the success of FoodCloud's introduction to eliminating food waste in Ireland and the UK, Food Safety and Charity Engagement Officer Karen McGrane-Capcarrere explains why education on food safety in the charity sector is vital.

On a global scale, it is estimated that approximately 30% of food produced for human consumption is wasted across the food supply chain. Closer to home, households in the Republic of Ireland (ROI) are

believed to spend around €700 on wasted food every year, while households in the UK are estimated to spend around £720 on food that is wasted each year. One organisation



Karen
McGrane-
Capcarrere

“FOODCLOUD HAS MANAGED TO REDISTRIBUTE THE EQUIVALENT OF 3.5 MILLION MEALS IN IRELAND AND THE UK TO DATE”

hoping to address the issues of food wastage across the island of Ireland is FoodCloud. The organisation utilizes a smartphone app and a website that allows businesses to put up details of leftover food produce at the end of each day. The app generates a text message which is sent to local charities, allowing the FoodCloud team to collect the food and bring it straight to the charity to be used immediately. FoodCloud has also joined forces with another organisation, Bia Food Initiative, who work on redistributing surplus food on a wholesale level. The nationwide partnership works under an umbrella organisation, FoodCloud Hubs – where the team accept surplus food from wholesalers such as farms, manufacturers and distributors, which is stored in a warehouse at one of their designated depots in Cork, Galway and

Dublin. The team then contact their registered list of charities to offer food supplies for delivery or collection to local charities in these regions.

Having worked as a chef for more than 20 years, Karen joined the FoodCloud team excited by its commitment to local communities and engagement within the charity sector as well as its mission to promote food safety.

FOODCLOUD: THE FACTS & FIGURES

To date, 800 large stores are live with over 3,300 charities signed up to FoodCloud services in the UK and Republic of Ireland. FoodCloud donated the food equivalent to 1.6 million meals in the UK. Across the ROI and UK, FoodCloud has donated 3.5 million meals to date.

FoodCloud Hubs

By the end of 2017 FoodCloud Hubs will have received 1,000 tonnes of surplus food for re-distribution in the ROI. This means 3,500 tonnes of CO₂ has been saved, with 100 food partners supporting 120 charity partners in the ROI. FoodCloud will work alongside UK foodbank FareShare, who will work as a partner in food distribution to allocate surplus food amongst its 4,000 registered charities.

Karen's daily duties include ensuring the food safety of not only the food stored at the FoodCloud Hub warehouses, but she also provides training to the charities engaged with the programme on food safety practices and how to best

utilize the food that they receive.

Another interesting area of Karen's job relies on her culinary skills, as she works closely with charities to develop menu plans. "The foods we can get in can be quite diverse, so sometimes the foods distributed to charities mean they might need a little bit of guidance in how to use the donation. The fact that I'm a chef helps, so when I see what comes in I draw up some recipes and ideas and work with the charity so that they can hopefully use the food a bit more effectively."

While there is a very robust system of food safety, food surplus redistribution is new in the ROI.

"In other countries they may have legislation to allow for food banks and redistributing foods, but in the Republic of Ireland, we don't have those guidelines to work with," Karen explains. Karen is referring to the Good Samaritan Law – US legislation that means that once a company or group donate to a charity, the charity themselves are described as the 'end user' of those goods. This means US foodbanks are offered indemnity, reducing the risks of liability. No such legislation is in effect in Europe.

Having worked with both the Environmental Health Association of Ireland and the National Hygiene Partnership, Karen also conducts food safety training at a largely reduced price to the organisation's charity partners. The Food Safety Authority of Ireland has also agreed to offer the 'Safe

Food' pack outlining guidelines and practices to any charity that registers with the FoodCloud initiative.

"It's effectively a food safety management system in one folder. One of the biggest challenges I have is to help the charities manage their food safety," reveals Karen. "Some charities are excellent at that, but some are smaller and need our support in helping set up a proactive and effective system."

The challenge in redistributing food safely is the decision of whether to use food immediately, or to store correctly to maximise the shelf-life of products. Despite the delicate balancing act, Karen says, "FoodCloud has managed to redistribute the equivalent of 3.5 million meals in Ireland and the UK to date." Providing safe nutritional food may be the main aim of their business, but Karen feels the support FoodCloud offers will have the lasting effect of promoting food safety in redistribution banks.

"If you can go out to a charity, see what they're doing and how they're doing it, and offer real support, it makes the difference. Food management and food safety systems can sound intimidating, but there are so many organisations out there helping with informing the public such as **safe food** or contacting the Environmental Health Officer.

"Just reaching out and making the information accessible is the hurdle we're working to overcome."

REDUCE FOOD WASTE THIS CHRISTMAS

With Christmas dinner prep just around the corner, be sure to get the most out of your grocery shop:



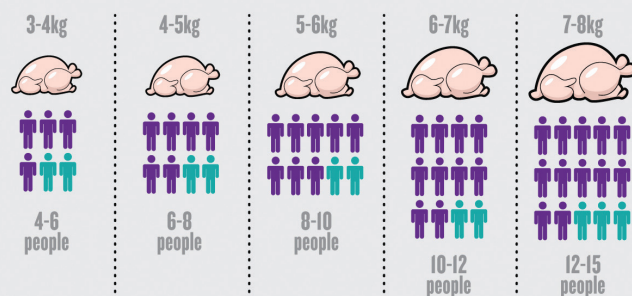
- Plan ahead this Christmas
- Plan your meals and know how many people you are cooking for
- Make a shopping list and stick to it
- Don't go shopping on an empty stomach – you'll buy more than you need
- Buy a turkey that will suit your needs
- Only buy what you need – the shops are only shut for two days!
- Buy food with a long shelf-life such as tinned, pickled or frozen foods
- Cooking food extends its use-by date
- Freeze leftovers

ABOUT KAREN

Hobbies/ Interests: Well I've three young children, so when I'm not working they keep me occupied. I also love travelling and eating out.

Favourite Food: Anything homemade, from scratch. I love eating a good homemade meal with my family.

HOW TO CALCULATE THE AMOUNT OF TURKEY YOU NEED



KEEPING IT CLEAN

Eddie O'Neill, Artisan Food Specialist for Teagasc, reveals how inadequate cleaning regimes could be causing cross contamination in food processing plants.

In terms of food safety, hygiene is one of the most important factors that can influence our decision as consumers to buy a product. So, understandably, it can be distressing for businesses when they are faced with the news that their food processing plant has been contaminated with biofilms. A biofilm is a group of bacteria that are protected by an impermeable layer that can provide resistance to cleaning agents and detergents. Biofilms can release bacteria regularly, causing contamination to both food products and

already spotted the signs of cross contamination.

Biofilms pose two serious threats to food processing plants, with Eddie warning "It can be incredibly serious – not only as a food-safety issue, but it takes its toll on a business owner's mental health."

Despite a company's attempt to implement an effective cleaning regime, if the routine isn't completed carefully, it could result in reduced shelf-life of a food or product recalls.

In a worst case scenario, the food may cause illness to a



Eddie O'Neill

Eddie also advises to follow the manufacturer's instructions when using cleaning agents. Remember - Temperature, Concentration and Time:

• **Temperature** - Use cleaning agents at the temperature the manufacturer recommends. If you use cleaning agents outside of their specified temperature range it may render the chemical ineffective and may be dangerous to use.

• **Concentration** of the cleaning agent – It is important to dilute the cleaning agent as per the manufacturer's guidelines.

• **Time** – The amount of time you leave cleaning chemicals on a surface is important. Remember, cleaning agents need time to work.

Unfortunately, biofilms are invisible to the naked eye, which means they may only become apparent when there are increased levels of unwanted bacteria in your final product. With

a few exceptions, the majority of food environments are wet areas and this moisture promotes the growth of bacteria, mould and viruses. To prevent biofilm formation, your cleaning regime should include frequently missed areas such as right-angle corners, crevices or cracks in tiles and flooring. Knowledge is power, and Eddie assures that if you have a properly maintained food processing facility, then you will largely eliminate the potential for biofilm formation.

When it comes to cleaning, it is attention to detail that can be the difference between food safety and cross contamination in the food processing chain: "When we're talking about cleaning, it's very easy to see a clean table. It's easy to see a shiny work surface but it's very difficult to see underneath a table's edge, drains, and wheels on equipment, underneath shelves, things

like that. That's where bacteria harbour to a large degree.

"If you can imagine any food environment, all the washing ends up in the drains. So the drains are absolutely huge issues for cross contamination. So we often emphasize the proper inspection and thorough cleaning of drains. We also discourage the use of high-pressure hoses."

High-pressure hoses cause cross contamination throughout a plant where people use them to clean drains, belts and equipment. They can spread bacteria around a food facility. Thankfully, there is help on hand for businesses who need advice developing an effective

WHAT ARE BIOFILMS?

Biofilms are groups of bacteria that stick together very tightly and can adhere to surfaces, such as those used in food production facilities, eg. stainless steel or plastic. Over time, biofilms can form on equipment, in pipes and on floors, where the cleaning regime has not been sufficient. A protective layer forms on the outside of a biofilm which can protect the bacteria on the inside from cleaning agents and sanitizers. Bacteria can be released from a biofilm regularly, allowing them to contaminate any food that they come into contact with. Biofilms can cause dangerous contamination of food products and can also result in elevated bacterial counts in the final products. Thorough, regular cleaning is essential in maintaining a biofilm free food facility.



"WHEN IT COMES TO BIOFILMS, PREVENTION IS KEY"

work surfaces in a food processing plant.

Eddie is increasingly aware of the threats that biofilm contamination pose to food processing companies. While he works on developing new food products on a day-to-day basis, Eddie confirms that an increasing amount of his work involves working with Dr. Kieran Jordan, providing support and information to businesses on hygiene.

"When it comes to biofilms, prevention is key," he says.

It is important for food businesses to know what biofilms are and know how to deal with them. Eddie finds that, in the majority of cases, when it comes to biofilm formation, companies have

consumer, and cause incredible mental stress to the business owner and to employees working there. If you have a product recall, then the name of your company and reputation can be called into question. Hygiene is critical when it comes to preventing biofilm formation. Eddie notes a number of steps to prevent biofilm formation, advising companies to:

- Remove any food residue using either a hot or cold wash
- Wash the area with a detergent
- Rinse all surfaces with water
- Follow with a sanitizer. The sanitizer is key as it destroys the bacteria.



cleaning regime. Reaching out to the right organisations can provide the information to bring practices up to speed. This is where Teagasc and other organisations can offer services. "We can advise companies on the ground, and through collaborations with organisations like **safe food**, we deliver free workshops around the country every year for people working in the food

industry," Eddie reveals. "We offer advice, and counsel on a one-to-one basis with companies who may not wish to talk publicly about the issues they have onsite."

Eddie cites networking as the greatest solution to any potential challenges in food production on the island of Ireland. Taking advantage of people's ability to connect should not be overlooked. Eddie feels there is a missed opportunity in the way food businesses network. He advises looking to experienced peers who can share their own insight into building a business with sustainable growth:

"There's a wonderful range of helpful individuals out there, who have years and years of experience in the food industry. They're only too happy to offer advice to not only people in the food industry, but to people starting out as well. It can be a great resource for those who want to grow their businesses and develop their products too. So for me, networking is key in the future of food production."

ABOUT EDDIE

Hobbies/ Interests: I love the sea and like fishing – it relaxes me. When I'm fishing, I find I'm in a world of my own and it's not about catching fish.

Favourite Food: I love to eat seasonal. I think that it is important to understand the seasonality of produce. I prefer to look at the seasons than eating one specific style of food.

KNOWLEDGE NETWORK EXPERT FACILITATORS GROUP

2016 has seen major changes to our Knowledge Networks, with the main one being the change from seven different networks and separate facilitators looking at different food safety topics, to one over-arching new Knowledge Network.

The Network is focused on food safety across the food chain, in six different sectors: red meat; poultry and pork; animal feed; fish and shellfish; fresh produce and dairy.

This new framework will allow us to focus on the most important food safety challenges, and be flexible enough to respond to new issues as they emerge, making sure that our members have the most up-to-date information possible.

To help us achieve our goals, we have assembled a single group of experts from industry, research and public health who will strategically lead the Network, guiding the activities and advising on required training and supports, new services for members and providing insights around both existing food safety risks and emerging issues. We believe the expertise of this group, chaired by Prof. Chris Elliott, will be invaluable to our members and to the strategic direction of the Network. The group has met twice over the last few months, and have had

productive discussions around priority food safety issues, innovative solutions to current food safety problems, and insights into the issues that may face us in the future.

We have already begun planning for 12 workshops for small food businesses in 2017, building on the workshop programme with Teagasc and CAFRE this year.

During 2017, the Network will continue to keep the members up to date on food safety issues and trends, encouraging shared learnings and discussion of emerging food safety risks and potential solutions. Our members can avail of events, briefings, workshops, newsletters and our website (www.safefoodkn.eu), and will have access to new resources, videos and webinars. With the support of the Expert Group, this all-island initiative will help ensure that food industry, regulatory and academic members, have access to the very latest developments in food safety innovation, emerging issues and in the detection and control of hazards in food.



Chairing the group is Prof. Chris Elliott Pro-Vice-Chancellor, Queen's University Belfast, while other members include Stephane Durand, Agri Food QUEST Manager, Northern Ireland Technology Centre; Micheál Cosgrove, Operations Manager, Glanbia Milk; Michael Bell, Executive Director, NI Food and Drink Association; Jenny Morris, Head TIFSIP, Chartered Institute of Environmental Health, London; Dr. Kieran Jordan, Principal Research Officer, Moorepark, Teagasc; Prof. David McDowell, Emeritus Professor Food Microbiology, Ulster University; Robin Irvine, Chief Executive Northern Ireland Grain Trade Association; and Dr. Declan Bolton, Principal Research Officer, Ashtown, Teagasc. Also pictured are Dr. Gary Kearney (**safe food**), Dr. Linda Gordon (**safe food**), Dr. Sarah Norberg (**safe food**) and Michael Hills (Queen's University Belfast).

BACK TO SCHOOL FOR ALLERGEN TRAINING

Providing training and support to parents and early childcare providers on all aspects of food, healthy eating and food safety, Shirley Hawkes, Operation Manager for Early Years, talks about food allergen training in the early childcare sector in Northern Ireland.

The role of early childhood educators and food safety management are now undeniably linked. While early educators are being trained to teach and protect young children, one agency based in Northern Ireland (NI) saw a real need to introduce food management and allergy training to benefit not just children but their parents and practitioners as well.

Established in 1965, Early Years aims to promote high quality childcare for children aged 0-12 years and their families in NI.

When Operation Manager Shirley Hawkes learned of the 'Little Bites' initiative in the Republic of Ireland (ROI), she reached out to **safe food** for guidance in adopting a similar approach in NI.

The Little Bites programme, originally created as a partnership in the ROI between **safe food** and Early Childhood Ireland, is a website offering insight and educational resources to parents and early

"OVER 350 FRONTLINE EARLY YEARS STAFF RECEIVED THE TRAINING"

childhood sector workers on a range of topics from healthy eating guidelines, to promoting food safety management for young children.

One area that needed urgent attention in NI was the lack of food safety and food allergen training for anyone in the childcare sector. With this realisation, and after conducting research, Shirley and her team in Early Years decided to adopt the idea of a Little Bites programme for NI.

"We had recently been out on the ground working with the sector and through focus groups, audits and discussions, we found people were struggling to get relevant information," Shirley explains.

After analysing feedback from the groups and surveys, the team in Early Years uncovered a worrying trend of childcare sector workers being forced to go online to source information without guidance. "They weren't sure what the source was, or where it was coming from. We thought it would be very good to get a one-stop shop so that we could direct our membership and so that we could be assured that they were getting the right information from the right agency."

As well as providing health guidelines and healthy eating campaigns, the Little Bites website offers information on nutrition, food hygiene, food allergies, intolerances, teaching and minimum standards for



playgroups and daycares. It also provides training resources in nutrition and food hypersensitivity, which has not been widely available in NI until now.

Food hypersensitivities are essentially food

allergy, food intolerance and coeliac disease. The symptoms can range from mild (such as stomach upset) to severe (such as shock or severe breathing difficulties), particularly in the case of severe food allergies. These are frequently diagnosed in early childhood and this training helps the Early Years staff manage food allergens and accommodate children with food hypersensitivities in their care.

Shirley explains how Early Years worked closely with **safe food** and pediatric dietician Ruth Charles, to develop both the content of the website and on-the-ground training. "The information was rolled out by **safe food** and Early Years over ten training sessions across NI.

"Over 350 frontline Early Years staff received the training, and this was across preschool, daycare, afterschools and schools.

"The training provided aimed to ensure there was greater knowledge and understanding of food allergies and staff were also trained to know what to do in an emergency."

Another benefit to the training was that staff were supported on how to work with parents and children, as well as writing policies in relation to food allergens. Speaking about the uptake in training, Shirley reflects on the challenges facing the early childhood sector when it comes to food safety, training and management: "Up until now, the main concern was the lack of training or knowledge. We were not receiving this from local level or from trust level and only that safe food came along we wouldn't have it at all. It's now up to us to keep this going and keep the training in practice".



Shirley Hawkes

WHAT IS LITTLE BITES?

The Little Bites website was originally developed as a one-stop-shop for food safety, food allergen and healthy eating advice for all early childcare providers in the Republic of Ireland. The site is a collaboration between **safe food** and Early Childhood Ireland. Early Years recently adapted the programme as part of a training series for frontline workers in the early childhood sector in Northern Ireland.

For more details visit <http://www.safe food.eu/Education/Pre-school>

ABOUT SHIRLEY

Hobbies/Interests: Getting more active with my three children who are between the ages of 8-13. I do 5k runs, colour runs and park runs with my family.

Favourite Food: Coming from a farming community, I think it's much more about the meat and veg rather than salads. There's nothing better than a Sunday roast.

BACTERIAL FOODBORNE ILLNESS AND MENTAL HEALTH

Written by Dr. Declan J. Bolton

Food Safety Department, Teagasc Food Research Centre, Ashtown and a member of the Knowledge Network Expert Group

Mental illness covers a wide range of mental health conditions, but refers generally to disorders that affect mood, thinking, and behaviour. Although the causes of mental illness are often unknown, it is clear that biological, psychological, and environmental factors all play a role, acting either individually or together. Among the biological factors, genetics (hereditary) resulting in abnormal functioning of nerve cell circuits or pathways are important, as are brain injury due to trauma, non-infectious diseases such as epilepsy, and birth trauma (oxygen starvation). While infections such as malaria, Legionnaire's disease, syphilis, typhoid, diphtheria, HIV, and herpes are relatively well recognized as causing psychiatric symptoms, others are less well documented and are more often associated with a symptom spectrum that does not include mental disability.

It has long been suspected and recent research from the Republic of Ireland has demonstrated that a healthy gut microflora (community of bacteria and other microbes residing in the gut) has an effect on emotional activity. When foodborne infections are investigated and treated, the focus is solely on the physical symptoms.

With correct treatment, diarrhea, abdominal cramps, vomiting and fever usually clear up in 7-10 days. In contrast, associated psychological symptoms such as depression, anxiety and general malaise are chronic illnesses that must be

endured for many years. This phenomenon was recently demonstrated after the 2011 Shiga-toxin producing *Escherichia coli* (STEC) O104:H4 outbreak, which occurred primarily in Germany and France although cases were reported in 14 other countries. By July, when the outbreak was declared over, 852 of the 4,321



Dr. Declan J. Bolton

cases were suffering from kidney failure and 54 had died. Six months after the outbreak, almost half of those who had been infected were suffering from poor psychological health with 43% complaining of persistent fatigue and 3% suffering post-traumatic stress disorder.

When a person is suffering from an infection they often display social withdrawal, reduced appetite and lethargy. These are perfectly normal responses as the body focuses resources on fighting the infection and recovering full health. However, these 'sickness behaviors' may persist long after the infection has cleared up if the infective agent establishes chronic carriage or there is a dysfunctional immune response. If we are to treat these conditions it is essential we obtain a better understanding of the underlying mechanisms. Some foodborne parasites, for example, such as the larval stage of the tapeworm (*Taenia solium*) or the tissue cysts of *Toxoplasma gondii* affect mental health by directly infecting the brain. In contrast, other parasitic and bacterial infections may contribute to mental illness indirectly via the

immune system or by influencing neurotransmission pathways.

Several studies have shown that foodborne infections may cause the development of depression, for example, in vulnerable individuals or exacerbate the illness in patients already suffering depression, by directly impacting on the brain or via the nervous system. Foodborne infections, such as salmonellosis and campylobacteriosis have also been associated with hypochondriasis and anxiety.

research from Germany also reported an association between these bacteria and Tourettes Syndrome.

Given the enormity of mental health issues in terms of personal suffering, adverse quality of life and costs to our health services, the link between psychological conditions and microbial infections can no longer be ignored. There is sufficient data currently available to prioritize the initial research objectives, which should include establishing the proportion of mental illness that may be

STUDIES HAVE SHOWN THAT FOODBORNE INFECTIONS MAY CAUSE THE DEVELOPMENT OF DEPRESSION

There may also be a link between bipolar and/or related disorders and bacterial infections. Research from the USA suggests that children that are genetically predisposed to bipolar disorder may develop pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS). Recent

directly or indirectly attributed to microbial infections and obtaining a better understanding of the mechanisms involved.

This article is a summary of the review paper 'Mental health disorders associated with foodborne pathogens' by Dr. Declan J. Bolton and Lucy J. Robertson, recently (2016) published in the Journal of Food Protection, volume 79 (11), pages 2005-2017.



RECENT EVENTS

Food Hypersensitivity Event

Chef Gearóid Lynch recently gave a demonstration at a **safe food** event in Dublin on gluten-free cooking, as an example of food allergen control in a catering kitchen. A second event in Newtownabbey focused on practical food allergen management and the legal obligations of food businesses. These events were attended by over 160 people.



Molecular Method Training and Expo Event

The **safe food** Knowledge Network hosted a two-day training expo in Backweston, Celbridge, Co. Kildare, attended by over 50 people from public and private food testing laboratories from across the island of Ireland. With laboratory tests changing from the time-consuming culture based methods, to more rapid and accurate molecular based methodologies, we wanted to keep people up to date. The course provided an introduction to molecular biology and provided guidance on how to set up a molecular biology laboratory. Suppliers were also onsite to provide information on the molecular technologies available.



CHRISTMAS FOOD SAFETY TIPS



- Check the use-by dates on food in shops. The use-by date is the deadline
- When shopping, pick up chilled and frozen food last
- Store raw foods and cooked foods separately at all times
- Perishable foods should be refrigerated as soon as you get home
- Don't overload your fridge
- Keep your fridge at 5 °C
- Defrost your frozen turkey fully before cooking
- When meat is fully cooked it will be piping hot all the way through, the juices will run clear and there will be no pink meat left
- To find out how long your turkey will take to cook visit our **safe food** turkey cooking calculator <http://www.safe food.eu/Christmas/turkey.html>
- Refrigerate all leftovers this Christmas
- Only ever reheat leftovers once
- Leftovers should be eaten within three days, unless frozen
- To freeze leftovers, cool within two hours, cover and freeze
- Food should not be put in the freezer when it's still warm
- Keep your freezer at -18 °C

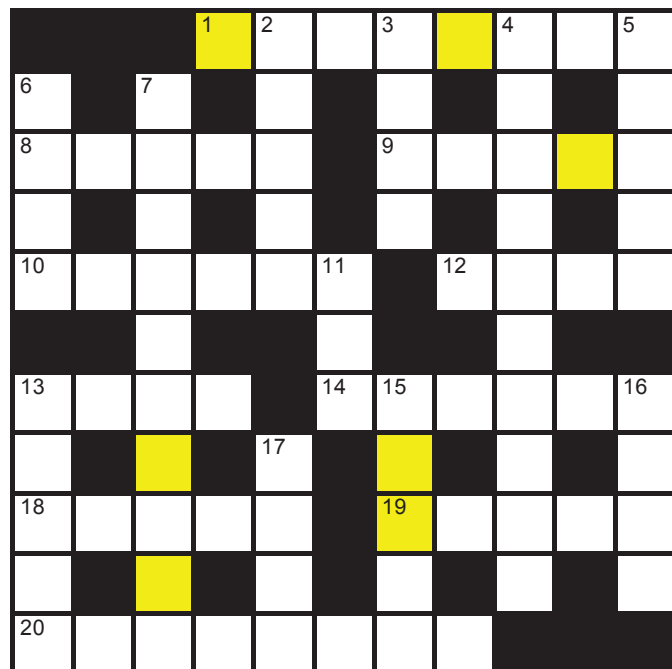
For more helpful Christmas food safety and cooking tips, visit <http://www.safe food.eu/christmas.html>



UPCOMING EVENTS

- **Seafood Safety:** New findings and innovation challenges: Brussels, 25th – 26th January 2017
- **Next steps for UK agricultural technologies –** investment, research and priorities for the Agri-Tech Strategy: London, 7th February 2017
- **Chemical Reactions in Foods VIII:** Prague, 15th – 17th February 2017
- **The GFSI Global Food Safety Conference:** Houston, 27th February – 2nd March 2017
- **IAFP's European Symposium on Food Safety:** Brussels, 29th – 31st March 2017

COMPETITION



For Christmas, **safefood** is delighted to offer **two** lucky crossword winners a luxury hamper of gourmet food from Arcadia Delicatessen in Belfast.

Simply find the hidden word in the crossword, made up from the letters highlighted, and send the answer to knowledgenetwork@safefood.eu before Friday 23rd December 2016. This competition is open to Knowledge Network Members on the island of Ireland only.

Winners will be drawn in January 2017.



Congratulations to Michael Hills, the Knowledge Network Manager, based in Queen's University Belfast, on his recent engagement.

We want to hear from you! Have you got any news you would like to share? Let us know. Email snorberg@safefood.eu

ACROSS

- 1 Inferior cut of pork or lamb (8)
- 8 Wine goblet or chalice, the most famous of which appears in Arthurian legend (5)
- 9 Type of coffee, after the Italian for milk (5)
- 10 Instruction, recommended to be done to food only once following cooking (6)
- 12 Pinot ----, the original French grape of which the Italian 'Grigio' is a clone (4)
- 13 Herb is a wise man, perhaps (4)
- 14 Dessert (6)
- 18 Circular potato snack item: Fab Four member (5)
- 19 Mad about almonds? (5)
- 20 A type of micro-organism (8)

DOWN

- 2 Middle Eastern confection made with sesame seeds and honey syrup (5)
- 3 Unattractive-sounding fruit! (4)
- 4 Cleaning materials used to remove grease, dirt and food from plates, etc. (10)
- 5 Flightless South American birds like emus, treated by US food safety authorities as poultry (5)
- 6 Food thickener; kind of jelly (sometimes named twice!) (4)
- 7 Germs that cause disease (10)
- 11 Darjeeling, for example (3)
- 13 Drink of fruits and spices associated with rum: small woody plant (5)
- 15 Mushrooms, for instance (5)
- 16 A nutritious type of bean (4)
- 17 Wine from red grapes whose skins are removed after fermentation begins (4)

Get Involved With THE FOOD CHAIN

We'd love to hear from you. Would you like us to feature your research or industry sector? What else would you like us to cover in the world of food safety? Send your article ideas, feedback and suggestions to knowledgenetwork@safefood.eu

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