

# AUSTRALIAN MeatNews

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VOLUME 15 | NUMBER 5 | NOVEMBER 2017

Slow Meat:  
solutions for  
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*Matthew Evans, from SBS Gourmet Farmer and Love of Meat was one of the speakers at the Slow Meat Symposium that explored ways for small businesses, in the meat industry, to compete in an increasingly commoditised market place. See story Page 14*  
Photo: Alan Benson

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Win a copy of *Dry Cured Meat Products* by Fidel Toldra. Page 7

Also: Buy a copy of *The Flesh in My Life* and support Lifeline. Page 22



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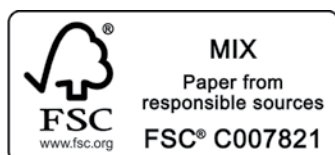
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Clive Richardson (centre) is the winner of the Eddie Andriessen award, pictured with Mintrac CEO Jenny Kroonstuiver (L) and Mintrac board member Geoff Yarham.

## Clive wins first Eddie award

Veterinarian, food safety consultant and long time contributor to *Australian Meat News*, Eddie Andriessen, has had a MINTRAC Meat Inspection and Quality Award named after him in recognition of his contribution to food safety training and inspection systems.

Nominees for the award must work in the Australian meat industry and have made a significant contribution to the training or professional development of meat inspectors or QA officers. The winner of the inaugural award is Clive Richardson, Senior Project Officer with Mintrac

Eddie is also the author and self published what amounts to the food safety and QA bible — *Meat Safety, Quality and Veterinary Public Health in Australia* that was first published in 1987. Eleven subsequent editions incorporated ongoing developments in risk assessment, technology, safety standards and domestic and international regulations. Historically meat safety was based on end point inspection and disease detection. Advances in public health and disease control, shifted the emphasis to process control and quality assurance.

The book was primarily written for meat inspection student and was designed to help improve meat processing and inspection standards to protect consumer health and to enhance Australia's position as a major exporter.

These days, Eddie is enjoying a very active retirement that includes his favorite pastime – exploring and challenging rivers in his canoe. ■



## Moisture infused Luv-a-Duck in time for Christmas

Australia's leading duck grower and producer, Luv-a-duck is set to launch their delicious new range of Moisture-Infused duck breast on 23 October 2017.

Grown in the heart of Australia's Wimmera region, the Moisture-Infused duck breasts protect against dryness when cooking, ensuring consistency and quality in every dish without compromising the flavour.

Ideal for high-volume kitchens where consistency is key and time is of the essence, each duck breast is a fixed 260-280g weight portion making preparation time minimal and ensuring uniformity on the plate.

Helping showcase the product, renowned chef Andrew Blake from Blake's Feast has created a recipe of grilled duck breast,



*Grilled duck breast by Andrew Blake.*

green mango, pomelo and cashew salad, while Geoff Lindsay from Dandelion and Lamaro's has created a recipe of seared duck breast with green peppercorns, apple and celery braised in pinot noir with caramelised onions and mashed potato – each dish championing the Moisture-Infused Duck Breast.

Renowned for producing quality and consistency among their entire range, Luv-a-Duck maintains this standard, developing a gluten free duck breast product that is tender, juicy, and easy to cook every time.

For further information about Luv-a-Duck and the release of their Moisture-Infused Duck Breast head to [www.luvaduck.com.au](http://www.luvaduck.com.au). ■

## FSANZ – packaging chemicals pose little risk to food

Food Standards Australia New Zealand today announced the conclusion of a three-year project looking at the risk of chemicals migrating from packaging into food and has determined that the chemicals investigated are not a concern for human health.

FSANZ Chief Executive Officer Mark Booth said that after a thorough risk assessment, FSANZ concluded the risk to public health and safety resulting from the chemicals migrating from packaging to food was low. "This assessment process has involved considerable work and two rounds of public consultation," Mr Booth said. "It also involved establishing an advisory group with industry and consumer

representatives, testing of foods for the presence of packaging chemicals and dietary exposure assessments," Mr Booth said. Based on its assessment, FSANZ has not recommended any further regulatory measures be introduced to the Food Standards Code.

"However, FSANZ continues to monitor the science in this area and is developing guidance, particularly for small and medium size businesses, to help them ensure packaging is safe." ■

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## CE certification for JARVIS stunners

Jarvis Products Corporation has announced its newly introduced Type C and P Power Actuated Stunners (PAS) have achieved CE certification.

These are the only cylindrical and pistol type, cartridge-loaded stunners, currently on the market, that have been CE certified. CE certification confirms products comply with European health, safety, and environmental protection standards. The stunners were tested and certified by PTB.



Type P stunner

Jarvis Model PAS Types C and P stunners are available in .22 and .25 calibers. Designed for operator comfort with one hand operation,

both stunners provide low cost, powerful stunning of bulls, cattle, hogs, sows, sheep or other types of livestock. They offer users a humane process for quick, efficient and high capacity stunning.

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Type C stunner

A wide variety of .22 and .25 caliber cartridge choices are available for both stunners. A range of cartridge power loads is available to suit specific applications. ■

## Milmeq plate freezers improve productivity for Linley Valley Pork



*Milmeq's plate freezer solution for Linley Valley Pork has catered for differing carton size.*

Milmeq has used a new innovation on its plate freezers for Linley Valley Pork, part of the Craig Mostyn Group in WA to increase its throughput and product quality.

Linley Valley packs its products in different sized cartons, Milmeq created a system that allowed the height of the freezers to be adjustable to adapt to the variation in carton size. By supplying two, 14 level plate freezer stack to accommodate a total of 480 small, 320 medium and 1152 large cartons, the pre-sorted cartons entered the system via conveyor where the sizing was automatically detected and the cartons assigned to the appropriate level on the plate freezer.

The 21-hour freeze time from the direct contact with the plates, this methodology delivered a significantly lower refrigeration index than blast freezing and improved Linley Valley product, particularly offal, which is packed warm. It has also reduced injury rates from manual handling of the cartons.

For Milmeq product manager – plate freezers, Brendan Dever the solution has not only met Linley Valley's brief with a custom solution but has become a market leader in freezer technology, while Linley Valley site engineer, Jim McGuckin said working with Milmeq had been a great experience and that it was great to have that level of commitment from Milmeq. ■

### Dataloggers for meat and smallgoods



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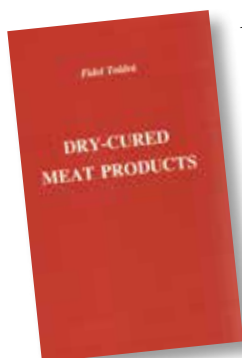
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# Understanding the chemistry of smallgoods



*Dry-Cured Meat Products* by Professor Fidel Toldra provides a detailed scientific and technical description of the biochemistry of dry cured hams and dry fermented sausages.

This book is written for professional, hands-on smallgoods makers and food technologists working in quality control and food safety.

*Dry-Cured Meat Products*, has numerous tables and charts and describes the underlying chemistry of the process of curing and fermentation in detail. The objective is to assist those making smallgoods to improve flavor and texture outcomes, fix defects and ensure food safety.

The book starts with a historical perspective, then goes on to describe the composition and organization of enzyme systems in muscle. It then discusses traditional and modern manufacturing techniques and the fermentation process. Two chapters describe the role of proteolysis and lipolysis in the development flavors. Common defects and their solutions discussed include: bitterness, sheepy and fishy aromas, formation of molds, rancidity, boar taint and the propensity to form crystals and films when packed. The chapter of food safety provides a schedule of critical control points and relevant protective actions.

Each chapter is fully and formally referenced.

*Dry-Cured Meat Products* (244 pages) is published by Food & Nutrition Inc. RRP A\$150.00 ■

## WIN WIN

To enter our competition to win a copy of: *Dry-Cured Meat Products* by Fidel Toldra. Answer the question below.

Send your answer and name and address & phone number to:

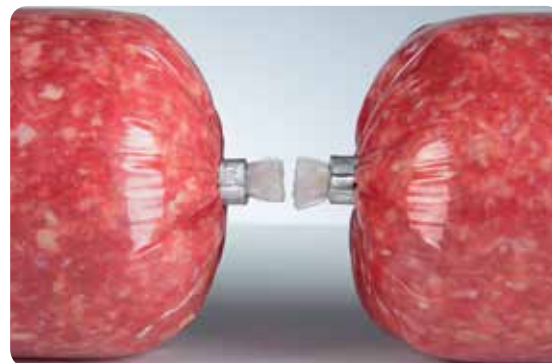
*Australian Meat News* Book Competition

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**Question:** According to the FAO, what proportion of food produced is lost or wasted?

**Entries close 10 February 2018**



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# Christmas ham to build customer loyalty

Christmas ham season is upon us and it's an opportunity for butchers to share their expertise and position themselves for the festive shop.

While sliced ham is a staple for many families year-round, the Christmas ham is seen as an essential festive purchase and very different product.

Recent research has found that it is intrinsically linked to Christmas and is the most popular festive protein purchased.

Australian Pork Limited Independent Channels Manager, Jennifer Fletcher, said while many butchers were already making the most of the opportunity this must-have Christmas item offered, it wasn't too late to maximize it.

"The research has found the butcher caters for a different ham experience, compared to the supermarket," she said.

"It found shoppers pre-ordered hams from butchers, trusted them and their produce and that made it the place to buy a whole ham on the bone.

"This is a ringing endorsement for butchers and also provides great insight into how independent retailers can differentiate themselves from the supermarkets. It shows that trust, built by product knowledge, freshness and advice, plays an important role, particularly at this stressful time of year."

Picking the right ham is a challenge for shoppers who generally select just one a year so Ms Fletcher said suggesting a serving size per person was a great help.

"The research also found hams served hot turned out better than expected, while leftovers tend to be used for simple recipes," she said.

"Those who cook a ham for Christmas are the most delighted, compared to those who served it cold. While we're always offering tips on how to serve leftovers, we found people really just loved a fresh ham sandwich or just tucking into the ham on its own."

Ms Fletcher said ham orders provide an opportunity to build and enhance customer databases, which were increasingly important in building the relationship and connection for repeat sales.

"If a customer has had a great Christmas meal with their family and you have provided tips, tricks and suggestions that contributed to that, they're likely to be back in the New Year – or maybe even sooner," she said.

"Use that opportunity to offer suggestions for lazy summer dinners, easy entertaining, school holiday survival food and more! If you've also got their email addresses, think about



getting them to accept emails from you that offer specials, recipe inspiration, cooking tip, and even the opportunity to pre-order next year's ham"

While ham might be the centrepiece, it's often combined with other proteins too.

"Of course, I think there's nothing better than also suggesting a crackling-crusted pork roast alongside a beautiful glazed ham."

Australian Pork are offering free Christmas point of sale kits for Butchers, which include a ham and a roast poster as well as a Christmas guide for customers, detailing recipes and tips, such as how to achieve perfect crackling. To receive a kit contact Jennifer Fletcher, Independent Channels Manager on 0449 191 924 or visiting [www.porkbutchers.com.au](http://www.porkbutchers.com.au) ■

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# Tradition, Family and Innovation in Rosedale

Ready-to-eat and ready-to-heat meals sound like a great idea but the key to success is integrating the process into a fresh meat business. Matthew Vaux at Rosedale Butchers has figured out how to make it work and value-add to the business' bottom line.

If you blink you might miss Rosedale, let alone Rosedale Butchers as you drive through Gippsland – but the locals know better.

On Tuesday, Wednesday and Thursday evenings Rosedale Butchers is abuzz as customers stream through to pick-up and take home their pre-ordered hot meals.

Last Tuesday, it was hot and ready to go pork shanks – slow roasted with garlic, green beans, creamy mash potato and roast apple – \$36 a 4 person serve, \$20 for two and \$12 for a single serve. All the customer had to do was check out the menu on Facebook, order by 5pm on Monday and pick-up and pay between 5.30 and 6.00pm on Tuesday evening.

On Wednesday, it was chicken kiev with chips and salad and Thursday was slow roasted rolled beef rib with roast veggies and gravy with similar pricing and pick-up time frame.

In many ways Rosedale Butchers is a very traditional family business. Matthew works along side his parents Neville and Debbie, and is the third generation to work in the shop. Neville took over the business from his parents Ray and Janet in 1995. Matthew completed his apprenticeship through William Angliss Institute in Melbourne in 2012.

The cooked meals wouldn't be a success without support of the full team. "When Mum and I are prepping or cooking, Dad and casual butcher Robbo keep the work load and customers under control.

"The extended family have been also been a huge help – my grandparents, sister, partner, aunty and her partner. They all bring different experience and ideas to the mix to ensure the meals run as smoothly as possible," Matthew said

Rosedale Butchers buy meat in carcase form from local processors. The challenge for all butchers is; what do you do with "secondary cuts"? Clearly discounting prices is not a viable solution, particularly in a small town.

Since the mid 1980s Rosedale Butchers have had a smokehouse, and typically make about 70kg of smallgoods a



*Neville, Debbie and Matthew Vaux. Matthew 27 – the third generation of the family to work in the business.*

week including cabana, ham and bacon, a value-adding option successfully used by many butchers.

Matthew has taken this one step further; firstly with ready-to-heat meals and more recently ready-to-eat meals.

"Rosedale has many young families and old and young singles," Matthew explained, "For singles buying meals is good value compared to shopping for food and reduces waste and many older people don't want to do meals-on-wheels.

"During the winter, we are particularly busy with footballers and netballers who train on Thursday evenings," Matthew said

Matthew started-out preparing ready-to-heat meals in 2014 using a small stove and bench-top oven. The next hurdle was to convince "management" they needed to buy and install a \$30,000 commercial scale combi oven and that a ready-meal program would pay for it.

*continued on page 12*

*continued from page 11*

Ready-to-heat meals are cooked and chilled. If not sold within a couple of days they are frozen. The meals are single serves and presented in sealed plastic take-away tubs. Matthew uses traditional recipes and natural ingredients. Beef and lamb roasts are the most popular priced at \$8-9, while sausages and potatoes are \$6.

Customers responded favorably to the ready-to-heat meals and some suggest it would be great if they could buy them hot – ready to eat.

In October 2016, Matthew launched his first ready-to-eat roast meal. Customer response was positive and in early 2017 the program was formalised with a ready-to-eat menu set for Tuesdays, Wednesdays and Thursdays.

The shop saves all unsold secondary cuts chilled and/or frozen until a usable amount is accumulated. It is then allocated to their four value adding options – their two meal programs, hot food (pies/pasties) and smallgoods. As with the ready-to-heat meals the ready-to-eat meal menu is driven by the volume of left over cuts accumulated from the shop.

“The convenience meal program also helps fresh meat sales,” Matthew said, “We can always sell lamb loin cuts and now we can order as many lambs as we need for loins because we know we have a profitable use for the legs and shoulders we don’t sell fresh.”



*Pre ordered ready-to-eat meals can be picked-up between 5.30 and 6pm on Tuesdays, Wednesdays and Thursdays. Meals are packed in easy to handle lidded aluminum trays.*



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“When buying in beef carcasses, we like to hang the good cuts for two weeks before sale and we can now value-add the excess cuts which benefits both the customer and ourselves. It’s also great because we haven’t had to buy boxed meat for a couple of years.”

The same applies to chicken. The shop sells more fresh chicken legs and thighs than it does breasts. Again, the imbalance is not a problem. Chickens can be ordered to meet demand for fresh legs and thighs and surplus breasts profitably used in the meals program.

Matthew uses Facebook to advertise the ready-to-eat and ready-to-heat menu along with the hot food range of pies, sausage rolls, pizzas and lasagna that is available at lunchtime through the week.

All ready-to-eat meals are cooked on the day and presented hot in easy to carry, lidded aluminum trays.

“We offer basic, healthy meals. Our roasts are the most popular. They come with vegetables and a choice of homemade sauces including BBQ, apple, and apple and mint jelly depending on the meat.

“In addition to the locals we have customers who live up to 25km away and many people have to drive some distance between work and home. There are two pizza and two fish and chip shops in Rosedale, so we have to compete with variety, quality, service and price,” Matthew said.

The preparation of ready to heat and eat foods demands high food safety standards. Rosedale Butchers has an active program to assure compliance at every level. ■

**Rosedale Butchers**  
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<b>10th Caprese Chicken</b> Chicken breast filled with tomatoes, mozzarella, basil and wrapped in bacon with balsamic glaze. Served with char grilled veggies.	<b>11th Corned Silverside</b> Corned silverside comes with steamed carrots and cabbage, creamy mash potato, corn and onion white sauce and housemade mustard.	<b>12th Lamb</b> Leg of lamb with housemade apple mint jelly.
<b>17th Lamb Shanks</b> Slowly roasted lamb shanks on creamy mash potato with smashed garlic peas.	<b>18th Lasagna</b> Matt's Lasagna served with housemade garlic bread and garden salad.	<b>19th Chicken</b> Rolled chicken filled with chicken mince, garlic, lemon, thyme, rosemary bacon plus gravy.
<b>24th Confit Chicken</b> Chicken maryland slow cooked in duck fat with potato gilette, honey baby carrots and garden salad.	<b>25th Roasted Lamb Shoulder</b> Slow roasted lamb shoulder in rosemary and garlic served with smashed veg and greens.	<b>26th Pork Belly</b> Slow roasted caramelised pork belly with sweet, salty peppery sauce.
<b>31st Beef Cheeks</b> Slow cooked beef cheeks in red wine with honey baby carrots and potato boulangere.		ROASTS COME WITH ROAST POTATO, PUMPKIN, CARROT, CAULIFLOWER AND BROCCOLI IN WHITE SAUCE.
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Posted on Facebook this flyer details Rosedale Butchers' ready-to-eat, ready-to-heat, hot foods and seasonal specials.

# Eat better meat and less of it



*Tammi Jonas, small scale pig farmer and president of Australian Food Sovereignty Alliance called for greater cooperation between small scale farmers and the meat industry at the recent Slow Meat Symposium.*

The phrase 'slow meat' is not about crock-pots and pulled pork, but an approach for small producers to work with their local butcher to raise the profile and consumer demand, for local quality meat.

In essence, slow meat is a move away from industrial farming and feedlots to locally grown, ethical farming practices.

At a recent three day symposium held in central Victoria in the depths of winter, farmers, producers, butchers and chefs learned more and debated about, the concept of slow meat. The Slow Meat Symposium aimed to bring together stakeholders in the meat industry to develop an action plan to encourage consumers to eat better quality meat, but less of it.

For the farmer producing slow meat is about raising animals that are grown at a natural rate, are well nourished and do not have an unsustainable impact on the land.

For the butcher it represents a back story on the farmer and the animal to tell the customer; provide a service to the consumer that is not commonly found in the supermarket and promotion of local community farmers and businesses.

For the chef locally sourced meat is based on seasonality where the vagaries of animals is allowed to shine – some weeks the fat cover might be higher, or the size of the animal might be smaller. Whatever the seasonal quirks, the chef works with what he has to provide a meal to be enjoyed.

Day one of the Symposium included a farm tour of a small pastured pig farm,





*The Slow Meat Symposium heard from guest speaker, Matthew Evans, of the For the Love of Meat, define how butchers and local producers need to embrace the quirks of seasonal produce.*

butchery and cooking demonstrations. A tour of Milking Yard chicken farm highlighted the differences between industrial chicken quality and that of small-scale poultry farming.

The second day was industry focused, with more than 80 butchers, chefs, producers and supporters of the slow meat concept participating. As MC, Paul West, the presenter of River Cottage Australia, guided discussions and group tasks to define what slow meat represents to the meat industry, hospitality and consumer. Guest speakers included butcher Grant Hilliard of Sydney's Feather & Bone, chef Matt Wilkinson of Pope Joan in Melbourne and presentations including James Melee of The Meat Room who *AMN* featured in the May issue this year.

To close the second day, chef and small scale farmer, Matthew Evans of SBS' *Gourmet Farmer* and *For the Love of Meat*, shared his views on what a slow meat future might look like and how farmers, butchers and chefs can embrace it.

"Slow meat is not just the breed of animal. A customer generally is not fussed what breed the pig is, but if

they know you cared about it, it was fed a nutritional diet and was allowed to do what pigs do and they know your story, that is enough," said Matthew.

"The industrial farmer doesn't always share the same world view or integrity on how to produce meat. Ultimately, that integrity comes through in the flavour and quality of product from small scale farming. Unfortunately, for the small scale farmer, it is not a money spinner. To change that, the message must get across to the consumer. The best way to achieve that it is to utilise the chef. The chef has the rock star profile, so they have the opportunity to sell the story of the butcher and the farmer through enjoyment of food."

In concluding, Matthew reiterated that small scale farming is not about producing the same portion size every single day; it is about the inconsistencies that come with the seasons that give the opportunity for chefs to really show case the natural flavours and characteristics of small scale farming.

The final day of the symposium focused on the struggles small scale farmers are facing with lack of access to regional abattoirs.

In an environment where many Australian abattoirs are closing their doors under the pressures of record high cattle prices, stock shortages and higher beef prices, perhaps the time is ripe to re-think how the Australian meat industry approaches producing and processing meat.

Amanda Carter, owner of Cool Hand Meats and poultry processor Foothills Pilot Plant in North Carolina, USA, has sought solutions to similar difficulties in the US and shared her experiences at the symposium.

The discussion focused on discussing the viability of small scale abattoirs, better networks between producers and abattoirs, price stability and



*Paul West, the presenter of River Cottage Australia, guided discussions and group tasks to define what slow meat represents to the meat industry.*

transport and access to and from abattoirs.

In a recent visit to eight small-scale abattoirs in a study trip to the US, Tammi Jonas, a small scale pig farmer in central Victoria and president of Australian Food Sovereignty Alliance (AFSA), found three key factors that make a small scale abattoir viable:

1. A multi-species facility for red meat is more viable than poultry alone;
2. Processing capabilities adds significantly to the bottom line and
3. An abattoir is a break-even enterprise at best.

In concluding the symposium the participants have drafted an action plan to:

- Create a platform to enable food waste to be diverted to farmers seeking alternative feed streams for livestock
- Collaboration with meat industry stakeholders to promote the slow meat concept to butchers and consumers.

In preliminary discussions with AMIC, Tammi is excited with the prospect of building a strategy to reach butchers to facilitate working with local meat producers, processing facilities and restaurants. This type of strategy was explored in the July issue when we

*continued on page 16*



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*continued from page 15*

spoke to The Meat Safe and a local murray grey farmer. As a butcher, Ben wanted the best possible outcome for the season from the cow, while Melinda worked to provide the best possible feeding regime she could to achieve the best results for Ben.

“Slow meat is not just better for our environment and the welfare of our animals, it offers a far more delicious future,” said Tammi. “Health and ethics are increasingly important to people and this is driving a shift away from industrially-produced meat. The Slow Meat Symposium saw some of our best producers, chefs and butchers gather to identify ways we can keep growing the slow meat movement so that more Australians can enjoy the benefits of eating better meat, and eating meat less often for the benefit of everyone and everything on the planet.” ■

## The continuing demise of abattoirs

The Churchill abattoir at Ipswich is the latest to fall under the pressures of record high cattle prices, stock shortages and consumer reluctance to pay the higher beef prices. The combination, described by management as the ‘perfect storm’ has left 500 without a job.

In the same month, Baiada announced that its poultry processing plant at Ipswich is set to close next January, costing another 400 people their jobs in the same district.

These two abattoirs are significant domestic meat facilities, but are not the only ones this year – add in Longford, Tasmania; Cobram, Victoria; Esperance, WA. Others in the last few years have been on shaky ground, if not closed including AMG Deniliquin, Southern Meats Goulburn, McGillivray’s at Gunbower, Inglewood and Biloela. A fire ripped through an abattoir this year in Sale, Gippsland, adding to the region’s lack of facilities.

While many have been suffering from elements of the ‘perfect storm’, others have become outdated in their technology making it difficult to upgrade.

What is not discussed in the public arena is the affect it has on the farmer. For many, the closures will mean animals are transported significantly greater distances, which for some is distressing – for the owner and the animals.



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1433552	4kg	GF Chili Con Carne Burger Mix	Gluten free burger premix with the classic flavours of chili con carne. Rich tomato undertones combine with highlights of chilli and spices to give punch to this winning beef burger mix.
1433553	4kg	GF Beef Pepper & Worcestershire Flavoured Burger Mix	Hearty flavour with a strong pepper note and undertones of Worcestershire sauce flavour. The inclusion of cracked pepper and dried onion bolster the appearance and flavour of the burger.
1433554	4kg	GF Smokey Maple Chipotle Flavoured Burger Mix	Sweet and smoky with a kick of heat, this gluten free burger mix has it all. Delicious combination of big flavours to brighten up any burger.
1433555	4kg	GF Texan Beef Burger Mix	Big state, big flavours. Spicy chilli flavours lifted on the back of savoury onion and garlic combine with smoky bbq flavours so reminiscent of the Texas backyard. With the added benefit of being gluten free.
1433556	4kg	GF Swiss Style Burger	Enhances the natural flavour of your meat of choice by adding savoury notes of onion, black pepper and chive. Yodelicious.

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2017 Entrants  
in the Lifeline  
International  
Young Butchers  
Picnic, Bob  
Retallick (l);  
Vince Garreffa (r)

## Extending a lifeline to young butchers

The Lifeline International Young Butchers Picnic is a celebration of the next generation of butchers, their futures and of life.

A charity event held annually in Perth to support Lifeline WA, the Picnic is now in its 14th year and held in conjunction with the Smokin' in the City competition as a street festival in Perth.

Its founder, Vince Garreffa is a larger than life character, well respected in Perth and in the meat industry in general. He is the owner of butcher shop Mondo di Carne in the Perth suburb of Inglewood, which has a reputation for quality butchery and products. Over the years, Vince has nurtured many young butchers through apprentices and into full time work and this event is the culmination of his desire to help young butchers

be passionate about the meat industry and support for his chosen charity, Lifeline WA.

The competition started at a grass-roots level with a few local apprentices and a couple from interstate, but has now grown to include an international representation from France, Canada, UK, Ireland and New Zealand.

Organiser and ambassador for the event Robert Retallick of GourmetBob – equally as passionate as Vince about the meat industry – says that the competition is for young butchers who show promise as a butcher, who have a desire to learn the trade and develop a network plus a

recommendation from an employer or educator.

“We have no formal entry requirements, it's mostly word of mouth,” says Bob. “From the extensive network Vince and I have we hear of young butchers that have potential and we invite them to take part.”

In the weeks leading up to the event, Bob will contact each of the entrants and advise them which primal cuts they will be using on competition day. In most cases it is beef, lamb and pork – often supplied through industry donation.

On the day Bob says the entrants are given three hours to create as many





*The Lifeline International Young Butchers Competition is held in a Perth street festival with Smokin' in the City.*

value-add dishes as they can to a retail standard. They are then required to cook one product and present it to restaurant standard, complete with presentation, garnishes and ticketing. The butchery and value add component is judged by three industry representatives and a further three chefs score the cooked product.

"Vince and I prefer not to be involved in the judging given that we are more than likely the ones to have brought these young butchers to Perth in the first place, so we collate the scores from the judges and do the award presentation. The competition is not about pitting contestants against each other but an opportunity to learn and grow and move forward in their careers."

Vince's connection to Lifeline started on talk back community radio, 6PR where he met Pastor Graham Mabury, where Vince shared in a radio segment his 40+ years of experience of butchering with the next generation. It became an invaluable friendship and strengthened Vince's passion for community service and his support for Lifeline WA.

"Vince will be the first to admit, and speaks openly with his own struggles as a young man with anxiety, depression and suicidal thoughts," says Bob. "It was the discovery of food

and becoming a butcher that changed his life around to re-discover the joy of life, and he wants to be able to share that with the next generation of butchers."

In conjunction with the Picnic, Vince and his wife, Anne host a Brunch through the Mondo Community Warriors to raise additional funds for Lifeline WA.

The success of the Brunch has seen fundraising of more than \$430,000 in 2016 and cracking the \$500,000 the year before. The concept of the

Brunch is for guests to enjoy the food that Perth and Western Australia has to offer, cooked by leading chefs and waited on by Perth celebrities. In the years that Mondo Community Warriors have been operating, the group has raised more than \$3million for Lifeline WA.

"Lifeline WA and Mondo Community Warriors have worked hard to make this a bigger and better event every year," says Nicole Bird, community partnerships and events coordinator with Lifeline WA. "From a small community event starting 19 years ago for butchers to promote their wares, it is now an international event with young butchers from all over the world. The funds raised from the event go towards training more telephone crisis supporters to operate Lifeline WA's 13 11 14 help line."

The next Lifeline International Young Butchers Picnic will be held 19-23 April, 2018. If you would like to know more contact Bob Retallick on 0418 576 850 or email [robert.retallick@gourmetbob.com](mailto:robert.retallick@gourmetbob.com)

For crisis or suicide prevention support, please call Lifeline on 13 11 14 ■



# The life of a country butcher - Paddock to Plate



*Wudinna Meat Store is located in Wudinna NW of Adelaide – about a 6 hour drive via Port Augusta.*

By Dr Eddie Andriessen BVSc RCA,  
Meat Industry Consultant (retired)

Recently while travelling to the Gawler Ranges in South Australia I stayed in Wudinna for three days and every night I dined out on the best tasting meat I have tasted for ages, so I sought out the source which was a local butcher based in Wudinna – Leon Petty.

Leon started working for the local butcher as a cleaner after school at the age of 14. When he left school at 16 he worked and trained at a number of butchers near Adelaide before returning to work for the Wudinna butcher and eventually he bought the business.

He built a new slaughterhouse in the late 80s to meet the new Meat Hygiene Standards and obtained his meat inspection certificate. He processes and inspects all his own meat and has been developing his business ever since.

Leon is a traditional old style butcher, who buys his livestock, fattens them for up to three months, slaughters them in his own small abattoir, ages the meat and breaks it up for sale in his butcher shop.

He supplies all the meat in the town and surrounding districts. Apart from the townspeople, he supplies the motels, the pub and the local supermarket.

In addition he supplies meat to a local tourism enterprise Gawler Ranges Wilderness Safari. This business provides an outback experience to a top-end international market. After a day out in the bush they expect a top quality meal as part

of their “glamping” experience and the meat supplied by Leon more than meets their expectations.

Leon and his son Zane run the run the shop, the slaughter facility and the feedlot with the help of two other full-time staff.

On the average he kills about three cattle, twelve sheep and six pigs per week. In addition he does contract kills for local farmers of about two cattle, five pigs and 10-20 sheep per week.

Wudinna is located in the vast sheep/wheat belt of South Australia so purchased livestock need to be finished before slaughter, so he operates a small feeding operation for cattle sheep and pigs utilising locally sourced lupins, hay and cereal grain.

He buys second cross lambs to fatten and kills at about 25-30kg dressed weight after three months in the feedlot. He purchases unfinished yearling beef and after a period in his feedlot he slaughters them at about 200-250kg dressed weight. He also feeds pigs to both the pork and baconer stages with a special emphasis on raising pigs for the Christmas ham market. He produces his own hams and small range of smallgoods.

Leon buys and transports his own livestock to his feeding operation and does not slaughter any animals until they have spent some time in the feedlot next to the





*Leon Petty and son Zane with two other full-time staff run the shop, slaughterhouse and feedlot. They typically process; 10 cattle, 25 sheep and 10 pigs a week for the shop and food service customers including contract kills for local farmers.*

slaughterhouse. This means that the animals are used to being handled and are virtually stress-free at slaughter, resulting in a high quality tender final product.

To maximise his income he also shears all his sheep skins for the wool after slaughter as the skins are virtually valueless.

This butchery operation is a truly vertically integrated operation with full control of the product from paddock to plate, resulting in a product of such a high quality that is hard to find in this day and age of high throughput processing.

Typical of rural Australia today, he is unfortunately one of a dying breed of butchers as the size of many country towns continues to fall. The population is about 500. In the last 20 years the number of children enrolled in the local school at Wudinna has dropped for 420 to less than 200. This is in response to the amalgamation of farms into larger more efficient operations requiring less labour input leading to a drop in population in the town and surrounding districts.

As the town is shrinking so his customer base is also shrinking. To counteract this he does more contract kills for other butchers in the district, with his reputation for quality helping to ensure he maintains his operation and gains more business.

Leon's situation is typical of many butchers in country towns and the trend across all Australian states is for these small operations to disappear and be replaced by boxed meat from



*Wudinna slaughterhouse*

centrally located abattoirs. In South Australia for example the number of country butchers slaughtering their own meat has dropped by 50% in the last 20 years

This is a pity as the quality of product and personal service that butchers like Leon can provide has also tended to disappear.

To reverse this trend of dropping populations many country towns across Australia have been innovative in developing new industries with tourism often leading the field. The Gawler Ranges National Park is a key tourism attraction that could be developed further as it is currently under utilised. ■

# Food, Friendship, Life

**T**he *Flesh in My Life* by Vince Garreffa is one man's life story that touches on the lives of millions of immigrants and hundreds of thousands who work in the meat industry.

It's about being different but finding common purpose and working together.

Vince Garreffa came to Australia, as a child with his family, from Calabria, Italy in the 1950s before settling in Perth. Vince's life in the meat industry started with his apprenticeship in 1965. In 1979 Vince started Mondo di Carne. Now known as Mondo's, an integrated retail and wholesale business based in the inner Perth suburb of Inglewood.

*"Meat is the symbol of my success ... More important are the people, the flesh and blood who walk beside me; teaching me, loving me, holding my hand or lifting me onto their shoulders. I would be nothing without them."*

*The Flesh in My Life* is the back-story to a successful career in the meat industry. It celebrates the energy, support and enterprise of Vince's family and extend circle of friends, associates and customers who contribute to his business and family life. In his words: "The Flesh in My Life ... the cord that binds us together."

*The Flesh in My Life* is a 200 page autobiography. It's mainly photos, with explanatory text. But it also includes 60 recipes, the formulae that underlie the preparation of food, the first step in the sharing of food – a powerful, cross cultural act of love that builds friendships and trust.

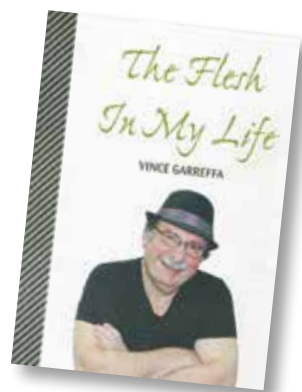
The recipes reflect the stages and events in his life: Chicken recipes relate to the chickens in the back yard of his childhood, "Garlic prawns helped me romance my wife", special risotto or snapper for his parents-in-law, his wife Anne's favorite roast – pork rack. And five-birds-in-one stuffed chicken inspired by his father, Rocco.

*The Flesh in My Life* is published by Mondo Butchers. The initial publishing costs were achieved through crowdfunding. The original supporters have been repaid and all profits from sales will be donated to Lifeline.

Cost \$50 plus \$15 for delivery by post anywhere in Australia

*The Flesh in My Life* can be purchased at:

<http://www.mondo.net.au/products/book> ■



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# Keeping cold cold and hot hot with good insulation

Many of the fundamentals of good insulation design are not well understood and inadequate or short-lived insulation is often the consequence, with high energy or maintenance costs, and even risk to human life or wellbeing the sad consequence.

**G**ood thermal insulation around cold or hot surfaces or spaces more important than ever with the current high energy prices. It takes expensive energy to heat or cool, and to lose this heating or cooling by having insufficient insulation is a constant but often avoidable energy cost. Hence it is important not only to apply the right insulation, but also to adequately protect this from moisture ingress, mechanical damage, weathering and other forms of deterioration so that the efficiency of this insulation is maintained for a long time.

There are many types of insulation material on the market, such as various types of mineral wool (glass, ceramic, alumina), hard foams (expanded/extruded polystyrene, various foamed phenolic compounds), as well as soft foams (typically closed cell foamed rubber materials). They differ in regard to their insulation effectiveness, or k-value, but perhaps even more importantly, they differ even more dramatically in their ability to resist moisture migration or absorption.

The critical importance of a carefully applied and perfectly intact vapour barrier for cold surface insulation cannot be understated and is one of the key longevity assurance measures for such applications.

Furthermore, very few insulation materials are physically strong and most are easily deteriorated by physical damage, UV radiation and chemical attack from common substances such as oils, fats and acids. Hard foams have some structural integrity, while mineral wools and soft foams are soft and without inherent physical strength.

And finally, they differ substantially in their ability to withstand especially higher temperatures, and hence fire resistance. The mineral wools are inherently suited to high temperature applications and have high fire resistance, whereas most common foamed compounds are less suited to high temperatures and few have a high fire rating.

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Unfortunately, no insulation materials score well all round, on strength, high temperature capabilities and vapour resistance, such that every choice is a compromise. The inferior aspects of a given insulation material must be recognized and will require measures to compensate for these to ensure an acceptable performance over an extended lifetime.

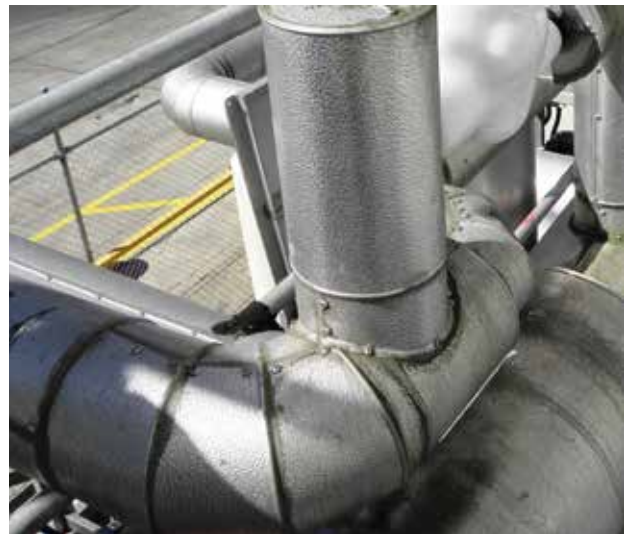
So what is best practice? This involves ensuring that the insulation material used:

- Is well suited to the range of temperatures and fire risks that the insulation is likely to experience.
- Is of an appropriate economic thickness to minimise operating ownership costs,
- Is well protected against damage that it may experience during its service life, and
- Is either inherently resistant to moisture OR is fully protected by a well-designed and well-applied vapour barrier completely free of any gaps or holes (even pinholes).

These comments apply equally to the insulation of piping and to insulation panels.

So what happens when less than best practice is applied?

When low temperature rated insulation (for example soft black closed foam insulation material) is used for high temperature application, two things can happen: firstly, the insulation deteriorates quickly, hardens and loses its insulation properties, but secondly and worse, the insulation



*Insulation on pipework needs to be fit for purpose, particularly when exposed to the elements.*

may smoulder and eventually ignite, with dramatic consequences.

If insufficient insulation thickness is applied, the most obvious penalty is the increased thermal losses, resulting in higher energy bills. More insulation saves energy, but there is an economic optimum that balances the capital cost of applying more insulation material against the energy cost savings. However, insufficient insulation when applied to cold surfaces can lead to condensate formation and hence dripping on the outside which causes maintenance and hygiene issues. Most often insulation thickness is selected for condensate avoidance rather than simple energy cost considerations.

Pipe insulation material	Thermal conductivity w/(m.K)	Moisture resistance factor, $\rho$ , [-]	Usage
Expanded polystyrene (EPS)	0.033	50 to 60	Used for chilled water applications and for temperatures down to approximately -20°C. Requires a high performance vapour barrier.
Nitrile foamed rubber (Armaflex)	0.034	7000	Applications to -40°C and does not require vapour sealing, but easily damaged.
Phenolic foam	0.02	50	Has high compressive strength, but requires vapour sealing.
Polyurethane (PUR)	0.02	40-200	Suitable for temperatures to -60°C. Polyurethane needs to be covered with a high performance vapour barrier for low temperature applications.
Polyisocyanurate (PIR)	0.023	40-200	Similar to Polyurethane but has superior early fire hazard indices.
Mineral wool	0.04	1-3	Used for insulation warm pipes only – high vapour permeability renders it useless for cold insulation.





*The most detrimental consequence to insulation is poor installation. Using strapping, minimising damage and not compressing it will allow it to function correctly.*

It is sadly all too common to see pipe insulation exposed to the elements or to physical damage by human or vehicular traffic. Many forms of cladding are available, often in kit form from the supplier of the insulation material, including PVC and sheet metal options.

Perhaps the least understood and most harmful defect for both pipe and panel insulation when applied to cold surfaces and spaces is the lack of a fully impervious moisture barrier. Even in the driest parts of Australia, air contains moisture and the laws of physics drives this moisture relentlessly towards any cold surface, where it condenses as dew or freezes as frost. Most insulation materials at best slow down this process unless they are well sealed using a vapour impermeable material. This applies to even apparently water repellent materials such as expanded polystyrene foam or polyurethane foam, which offer little resistance to moisture ingress and accumulation unless well protected.

And the colder the surface, the more relentless this migration of moisture. A hole the size of a pinprick in any pipe can cause a big leak if the pipe contains a fluid under pressure, so a hole the size of a pinprick in any covering that protects the insulation from moisture migration will cause moisture to stream into the insulation. The actual pressure difference that drives this moisture migration can be nearly equal to atmospheric pressure.

All vapour entering the insulation is there to stay and causes the insulation to eventually become waterlogged and heavy, with various serious and even catastrophic consequences.

In Australia, the use of segmented or spirally wound metal cladding both as physical protection and as vapour barrier is common, but unless great care is applied to sealing the joints between overlapping sections of cladding with durable mastic, achieving a reliable vapour barrier is difficult, and the common use of pop-rivets to join the cladding sheets to one another undermines the integrity of the vapour barrier further. Some insulation contractors use tech screws rather than pop rivets and apply sealant to the pop-rivets externally. As a consequence, waterlogging of insulation occurs often within only a few years.

Some insulation contractors, particularly in the USA and Europe, apply a specially designed vapour barrier film over the insulation before fitting the cladding, and then fix the cladding with strapping rather than pop-rivets to avoid any damage to this vapour barrier. This ensures a durable and long-lived vapour barrier even at bends and T sections on the piping.

Insulation panelling is equally susceptible to water-logging. Sometimes this is due to physical damage to the panelling (eg forklift damage), but more often the water logging is the result of poor practice in sealing the joints between panels and the ends of the panel. Moisture can migrate along the full length of an insulated panel, so that a poorly sealed corner joint could result in waterlogging of the entire panel.

Careful application of sealing mastic especially on the outside skin of panels is essential, as it is for floor channel and corner coving. If screws or pop-rivets are used to fix channels or coving, these need to be carefully sealed, but often this is not done adequately or at all.

Some quality panel manufactures assist the sealing by using camlock fasteners to lock adjacent panels to one another, but this is the exception in Australia.

Waterlogged insulation loses its insulating characteristics resulting in increased energy costs. The increased weight can cause roof panels to collapse, or piping to break from its supports, sometimes with fatal consequences. But water logging also accelerates corrosion of the underlying pipe material as well as the external cladding, and it cannot be repaired and must be replaced.

So where does this leave the end-user? Money spent on inadequate insulation is wasted money and any savings that may be achieved with common short-cuts or shoddy installation practice will quickly cause an increase in operating and maintenance costs. Be wary and question the suitability and integrity of the insulation proposed to you by your contractor. Request a 10 year vapour seal integrity guarantee. Or seek professional independent advice to help you select the best solution for your situation. ■

# TVI ASR 300 MULTIPICK delivers *hand-made* kebabs

The repositioning of kebabs as a high quality product has received a major boost with the availability of the ASR 300 MULTIPICK automated kebab stick machine in Australia. Constructed by TVI, the ASR 300 is available from Multivac Australia.

**S**tate of the art robotics and the smart complementary utilisation of manual labour allows for the ASR 300 to produce high quality kebabs at rates of up to 4200 skewers per hour depending on the final product.

In Europe, both large and small operators have successfully adopted the system to cut production costs while producing an up-market, premium-priced product.

The ASR 300 has altered the traditional way of making kebabs, where meat and vegetables are loaded into a box; skewered, then sliced in a parallel manner to the skewers to produce industrial-looking, elongated meat and vegetable oblongs.

The ASR 300 robot manages the skewers and trays – specifically the loading of the skewers.

Meat and vegetable pieces are custom cut and held in a bunker. From the bunker, the meat and vegetable components automatically fall directly into the product cavities on the trays.

The employees in the system focus solely on checking the orientation of the meat and vegetable pieces in the trays and

filling any empty cavities. Using both hands, the operators can fix up to 150 pieces per minute.

The robotic hand then grasps 12 sticks at a time and skewers the individual meat or vegetable pieces on the tray according to the recipe. The recipe can also be altered with the simple change of the program.

The skewers can be set up to hold between 2 and 18 pieces. The system can handle meat, onion, capsicum, tomato, olives, sausages, meatballs, vegetables, fruit and cheese. The robotic arm handles round, flat and steel sticks between 120 and 260mm long.

The loaded skewers are then placed on a conveyor belt or in trays and moved out. The ASR 300 can produce (depending on the recipe) between 200 and 400kg of product per hour.

A major benefit of the TVI ASR 300 system is the final appearance of the product. Kebabs look handmade as the system preserves the unique appearance of hand cut and skewered pieces of vegetable or meat. This handmade appearance is achieved while reducing the labour component in production by as much as 80%. ■



*The ASR 300 robotic arm picks-ups and loads the skewers and selects the required meat and vegetables in a sequence specified by the operator.*



# Serious about the seal

In the last issue of *Australian Meat News* we ran a News item about food packaging company, Krehalon bringing secondary seal packaging for fresh produce. The company claims some amazing results, so we investigated further.

First presented at IFFA 2016, Krehalon demonstrated the Secondary Seal capabilities to a host of meat industry representatives who were after a new technology for vacuum packing and hot water shrinkage.

The company describes the Secondary Seal (SSL) technology as a 'special sealant material that allows the inner packaging layers to fuse together through the normal production processes of vacuum packing and hot water shrinkage'.

The result, according to Australian managing director, Jon Delaney, is improved reworking of product, improved yields and lower blood losses for fresh primal cuts and maximizes the benefits of spray chilling.

"The bag collapses around the product during the vacuum stage and then once it hits the hot water tank a chemical reaction occurs, causing the plastic to self weld, creating a secondary seal," said Jon. "By doing that, it slows down any bacterial growth, extending shelf life and retains the moisture content."

Results have shown that using the SSL technology has extended shelf life from the typical 120 days to more than 130 days for spray chilled primal beef cuts and 150 days for internally chilled beef primal – vital when exporting to the USA and Europe as temperature variations can be a major concern. Evidence also shows that yield gains of 1-2% are being achieved. The product can be used on beef, pork, lamb and poultry and are available in 40, 50 and 70 micron options.

Beef Cuts				
	Sirloin	Rump	Fillet	Rib eye
Pack weight	7.50kg	6.0kg	2.50kg	3.0kg
Blood retention/saving	0.7%	0.8%	1.0%	1.7%

Source: Krehalon, UK

The SSL is a grade of bag (the ML40) used in conjunction with the company's Flovac and FormShrink products and is effective in both automated and manual bagging processing line. Flovac films utilise so called flowrap technology which is an automated inline system that enables every product to be measured before packing so that each bag is made to the optimum size of each product, allowing for precise material-to-product ratio.



*On an automated processing line, the use of Flovac films and second seal plastic removes the need for shrink bags, improving productivity.*

Form Shrink films utilise thermoforming technology which is an automated conveyor-fed system where the films are heated to a certain forming temperature enabling them to be formed to a specific shape in a mould. These are then trimmed and shrunk to create the desired pack presentation

"Measuring and cutting the plastic to suit the dimensions of the primal cut portion minimises any wastage from using an over-sized film," says Jon. "Krehalon have been working to make the plastic film more efficient so that you can reduce labour costs of traditional shrink bags with a shrink bag replacement automation system (SBR) which in turn lifts productivity." ■

# Would you like 3D fries with your 3D printed burger?

Is 3D meat printing the next big thing in the meat industry and will it slice and dice the industry?

By Susan Webster

**L**ate last year Meat and Livestock Australia (MLA) released a report which aired its policy on liquified meat protein – known as meat ink – printed in layers in a processed called additive manufacturing.

MLA manager high value foods frontier, Michael Lee said: “We are not saying this technology will replace all sausages and steaks, but on some occasions 3D printed meat will be available, and sometimes preferable.”

In the future every kitchen could have a 3D meat printer; much like they have a microwave today, he said.

“This will not replace steaks sold from a butcher or a supermarket, but it may present a value opportunity. Currently one-third of each animal ends up as low-value burger trimmings for retailers like McDonald’s – why not see if this new technology gives us the opportunity to create more value for our farmers?”

Demand-drivers for this technology will be transgenerational – starting with the elderly and infirm. “There will be new markets such as consumers who cannot chew red meat. A 3D printer can produce a steak made from red meat,” Mr Lee said.

Health-focussed consumers will seek the product for personalised diets. And for time-poor millennials and GenX, the appetite will be for fast meals. “We see a lot of opportunities for 3D meat from the growing trend of snacking,” Mr Lee said. “People no longer sit down for three meals a day. Consumer lifestyle changes are creating opportunities such as red meat in a different format. They want confidence in the product but it must be simple.”

Mr Lee said the MLA is starting with the concept of red meat and then asking what can be added to make it attractive for these new markets by starting with the idea of what makes a great burger but simple to create. Labelling it for what it is and stating that it does contain red meat and not a concoction of chemicals is important for the consumer. Chuck, offal and flap meat are among the cuts mentioned as being suitable for conversion to meat ink.

Mr Lee said the MLA is looking at who would adopt 3D meat printing.



*Michael Lee, MLA manager of high value foods, says there is potential for 3D meat products.*

“There will be a demand from consumers who will want to have a printer in their kitchen. It was the same with microwaves. Some consumers wanted them very early on despite the cost.”

Other uses will be in commercial kitchens, but also perhaps on aircraft enabling individual needs to be catered for on a flight. Mr Lee sees other opportunities in areas such as pop-up stores.

“We see 3D printing as an incremental business,” he said. “We don’t see it as replacement business. MLA is keen to open up new markets and usage among consumers. It is early days to see the real potential of 3D meat printing but there are opportunities,” he said.

“And like all new technologies, the price is coming down. The machine we are looking at is now about \$4,000 compared to a few years ago when it was \$10,000.”

Then there are the business opportunities for suppliers in providing the meat for the printer cartridges.

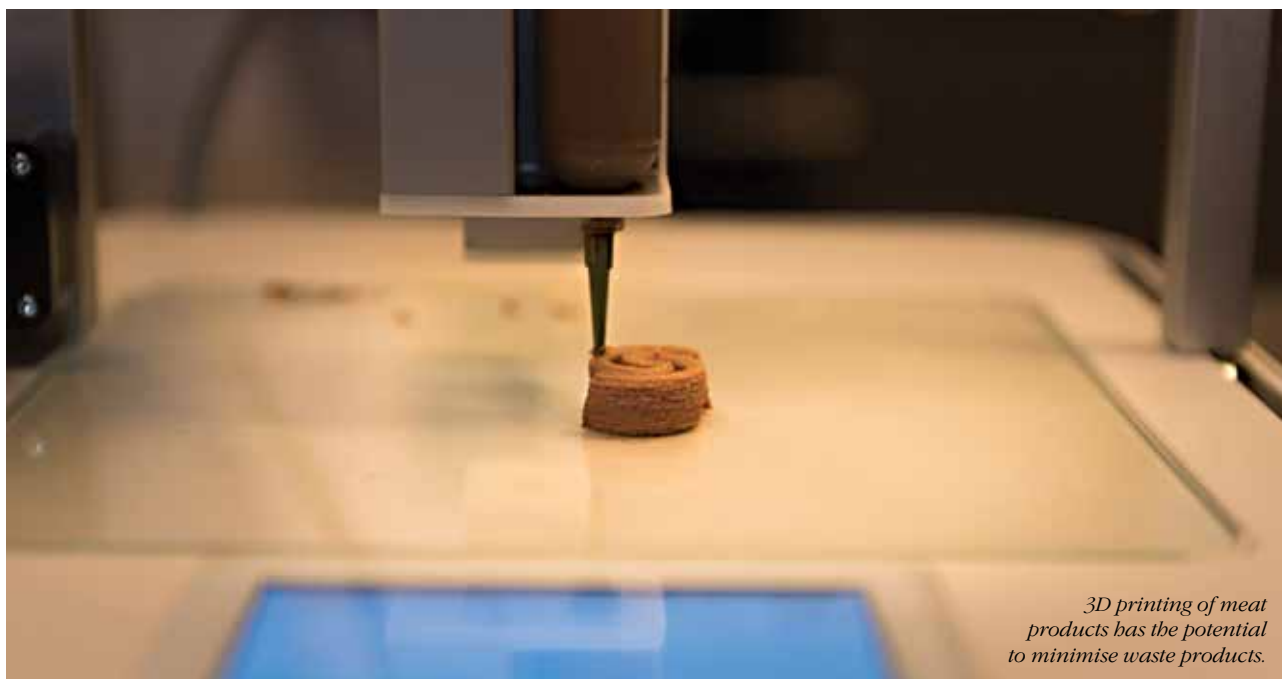
“There is a business model for the meat pods to put in the printers, like coffee pods, that will sell at \$300 a kilo,” he said.

“And I am sure there are many suppliers who would want to get that sort of return. This is disruptive technologies that can unlock value.”

Not everyone is convinced. A major red meat supplier said the technology was unlikely to pay for itself.

“Every element of meat processing entails a cost, and this technology requires extra processing to liquefy the meat to a flowable stage. Then it has to be mixed with fixatives and then extruded to form the meat product. There’s probably no cost benefit over current hamburger/patty manufacture.”





*3D printing of meat products has the potential to minimise waste products.*

He also warned that the product would lack consumer appeal. “You’re selling into a marketplace increasingly seeking information on provenance and the farmer back-story. These meat products would have none of that.”

A recent Australian/French report suggests the use of 3D meat printing represents an excellent opportunity to value-add to lower value meat by-products such as raw meat and offcuts.

The report was prepared by the School of Animal and Veterinary Sciences at the University of Adelaide; School of Veterinary and Life Sciences at Murdoch University in WA, INRA at Saint Genès Champanelle and Clermont Université, VetAgro Sup in France.

“Although still being considered an emerging technology within the food industry, there has been increasing interest in its application in the meat industry,” the report said.

“One possibility is to make use of meat by-products to form slurries that can be applied in this layering process. “The ‘printing’ process is simply extruding the meat paste, which is glued together with normal food-grade enzymes.”

The report said printer techniques will probably be suitable for processed meat products such as burger patties or novel objects made from meat paste as the technology is not yet advanced enough to reconstruct the connective tissue.

“The key factor that drives acceptance of novel food is the perceived benefit to the consumer,” the report said. “On this basis, market opportunities are likely to be restricted to the snack-food, pre-cooked-meal and aged-care sectors.

“In the short-to-medium term future, conventional meat products will remain at the premium end of the market with little competition,” the report said.

Compared to traditional red meat production, the report

says 3D printing will value-add to waste products delivering environmental benefits.

This would be achieved through reduced use of resources and a reduction in waste.

But health benefits and food safety are still untested, although regulation costs are expected to be low.

There will be some consumer resistance due to the use of technology in the production but the majority of consumers will be accepting.

The report said labelling will be very important to avoid 3D printing becoming a barrier to consumer acceptance.

A 3D printer featured at a Melbourne conference earlier this year. The briefcase sized ByFlow printer from Holland was used to create delicate flower-shaped morsels of reconstituted beef used in dishes crafted by MLA chef Sam Burke.

According to Frits Hoff, the business development manager for the printing firm, the food ink cartridges can be filled with bio-synthesised peptide chains grown from a bacteria/algae medium or from meat ink. Europeans prefer the latter option, he said.

“People definitely want natural food ingredients with no additives. This level of acceptance may change as the price of synthesised food comes down and the taste improves; two years ago the first synthesised meat hamburgers cost \$250,000 each to produce and now are \$10. Who knows when it will be cheap enough for McDonald’s?”

But what does it taste like? Dr Aarti Tobin, CSIRO’s team leader in Meat Science, said the team made recombined meat from a meat paste. “The cubes were nice and soft, looked like diced meat. Once you put it in your mouth you just pushed it against your palate and they fell apart and formed a nice poultice.” ■

# Price differences drive consumption trends

Chicken is predicted to be the star meat performer in terms of sales and per capita consumption in 2018, according to forecasts published by ABARES in late September.

While lower saleyard prices for beef and pig meats are expected to increase competition, productivity improvements and lower grain prices are tipped to maintain the downward pressure on retail chicken prices.

Chicken meat consumption is forecast to increase by 3% year-on-year to an average of 50 kilograms per person in 2017, a new record high.

This compares with pig meat at 28kg/person, beef and veal 26kg/person and sheep meat 8.5kg/person. Chicken will account for about 44% of domestic meat consumption by volume.

Chicken's dominance is driven primarily by price and is expected to

be maintained despite a predicted decline of 18% in the over-the-hook price of pork, and an increase of 4% in pork production through 2017-18.

## BEEF

Beef and veal saleyard prices are predicted to fall by 13%. The fall will be driven by increased turnoff, resulting in a 5% increase in slaughterings to 7.8 million head and an 8% increase in production due to increased slaughter weights.

Cattle prices will be also undermined by weaker export demand. Longer-term cattle supply should remain strong as cattle numbers are predicted to continue to increase by 4% to 26.7 million.

Export volumes are predicted to increase by 10% but export prices are expected to weaken reducing the value by 1% to A\$7.0billion

The US export volumes are predicted to increase by 27% to 260,000t but still remain 27% below the long-term average.

**Japan:** will remain under pressure due to strong exports from the US. Exports to Japan are predicted to increase 6% to 291,000t. This increased volume will be offset by the price that declined 13% in the year to June 2017. US exports to Japan increased 50% over the same period.

**Korea:** is predicted to increase 3% to 185,000t. Most of this increase will be frozen, as the US will provide strong competition for chilled product. Exports to China will increase by 1% to 105,000t. China accounts for about 10% of Australia's beef exports.

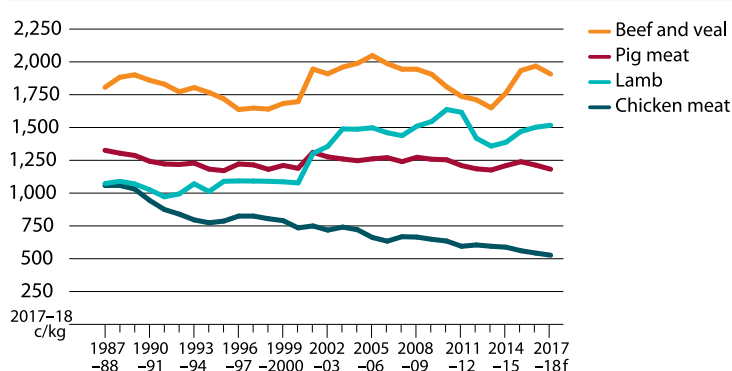
Live exports are forecast to increase 4% to 850,000 head valued at about A\$1billion and an average price of A\$1260 per head. Most will go to Indonesia and Vietnam.

## SHEEP MEAT

The saleyard price of lamb is forecast to rise 6% to an average 625c/kg carcase weight in 2017-18 due to continued flock re-building and strong export demand.

Poor weather has affected flock build-up in some regions forcing sheep onto the market. But despite a decline in slaughter numbers, store lamb prices have remained strong indicating demand from restockers.

Real Retail Meat Prices Australia 1987 to 2018, adjusted for inflation

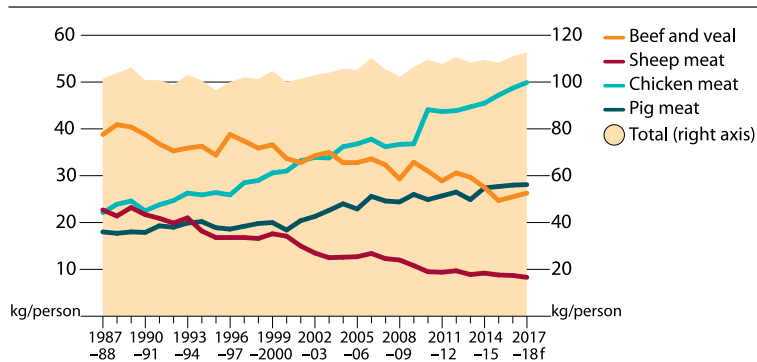


This chart highlights the significant decline, in real terms, of the retail price of chicken. Pork prices have declined marginally, lamb has increased significantly while beef has remained broadly unchanged but relatively volatile. Since 2013 beef has increased sharply along with lamb while pork and particularly chicken have continued their downward trend. In 1987 beef was 70% more expensive than chicken and lamb. In 2017 beef is nearly four times the price of chicken. The Australian trends are reflected in most developed countries including the US where more efficient production systems and vertical integration has led to efficiency gains and lower costs.

Source: ABARES. f = forecast



Meat Consumption per person 1987 to 2017



While total meat consumption has remained broadly constant for the past 30 years the mix of meat consumed has changed significantly. Beef and lamb has steadily trended down while pork and chicken have increased.

Changing meat demand in Australia is attributed to factors including relative retail prices, growth in incomes and changing tastes and preferences.

Note 1: The left scale shows the kg consumed of each meat. The right scale indicates the total consumption of all meats.

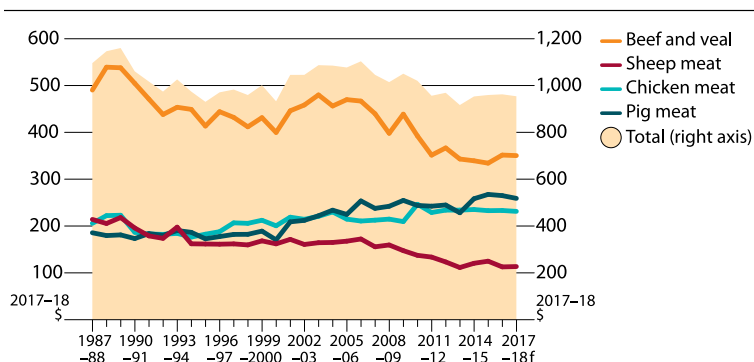
Note 2: Meat consumption in Australia is expressed in carcase weight equivalent. The equivalent plate value is  $0.7 \times$  carcase weight.

Source ABARES. f = forecast

Lamb export volumes are predicted to increase 1% to 258,000t values at A\$2.0billion. Demand from Asia and China is forecast to grow for the long term due to rising incomes.

Mutton exports are forecast to grow 1% to 134,000t. Main customers are the Middle East where economic conditions are predicted to improve due to higher oil prices. ■

Real Meat expenditure, per person, Australia, 1987 to 2018, adjusted for inflation



The chart shows the per person total expenditure, adjusted for inflation, for all meats and for beef, sheep meats, chicken and pork.

Over time, an increased share of this expenditure has been on commercially produced foods, and less on meats for home meals. Over the past 30 years household expenditure on meat has declined from 19% to 13% and the share for commercially produced meals (fast food and restaurants) increased from 26% to 33%.

Note: Meat expenditure is the product of apparent per person meat consumption converted to a retail weight equivalent and the corresponding retail meat price.

Source: ABARES. f = forecast

## Arrow and Key merge to deliver better diagnostics

Arrow Scientific and Key Diagnostics have merged and will continue to trade as Key Diagnostics.

Louis Petrin said the merger would build on the two companies' customer relationships and shared values, quality products, high levels of support and service.

Within the merged group the Arrow team will continue to offer products and equipment for testing food quality and safety which will complement Key Diagnostics background in hygiene testing.

The merger will give meat companies Australia wide, access to a wide of range tests and services, from simple protein residue tests to ATP to more advanced microbiology and pathogen tests.

Louis Petrin who ran Arrow Scientific for the past 26 years said that he had been seeking a partner who appreciated the food testing business and understood the Arrow culture and could develop its potential. ■



*A poorly cleaned mesh grate can harbour bacteria such as listeria.*

# Don't let hygiene go down the drain

The floor under your feet in a processing facility is host to all manner of likely contaminants and needs frequent cleaning, but what about the drains you are washing down into it?

**T**he design, surface and application of the processing floor has been well covered in AMN, but the aspect of drains has not.

Is your drain easy to clean? Is the size of the drain suited to the flow rate that needs to be discharged? Can it take the weight of a forklift or smoke house trolley? Is the drain safe for staff to walk on?

There are three core elements to a drain – the grate that sits on top; the channel or point drain set into the floor and the underlying pipework.

Design is a fundamental element of a hygienic drainage system, says product manager Kate Jennings of ACO Australia. Poorly designed or badly installed drainage systems can be difficult to clean, often leaving behind stagnant water and grime that can harbour bacteria such as listeria, E. coli and salmonella.

A report by Wiley for Top Trends says that:

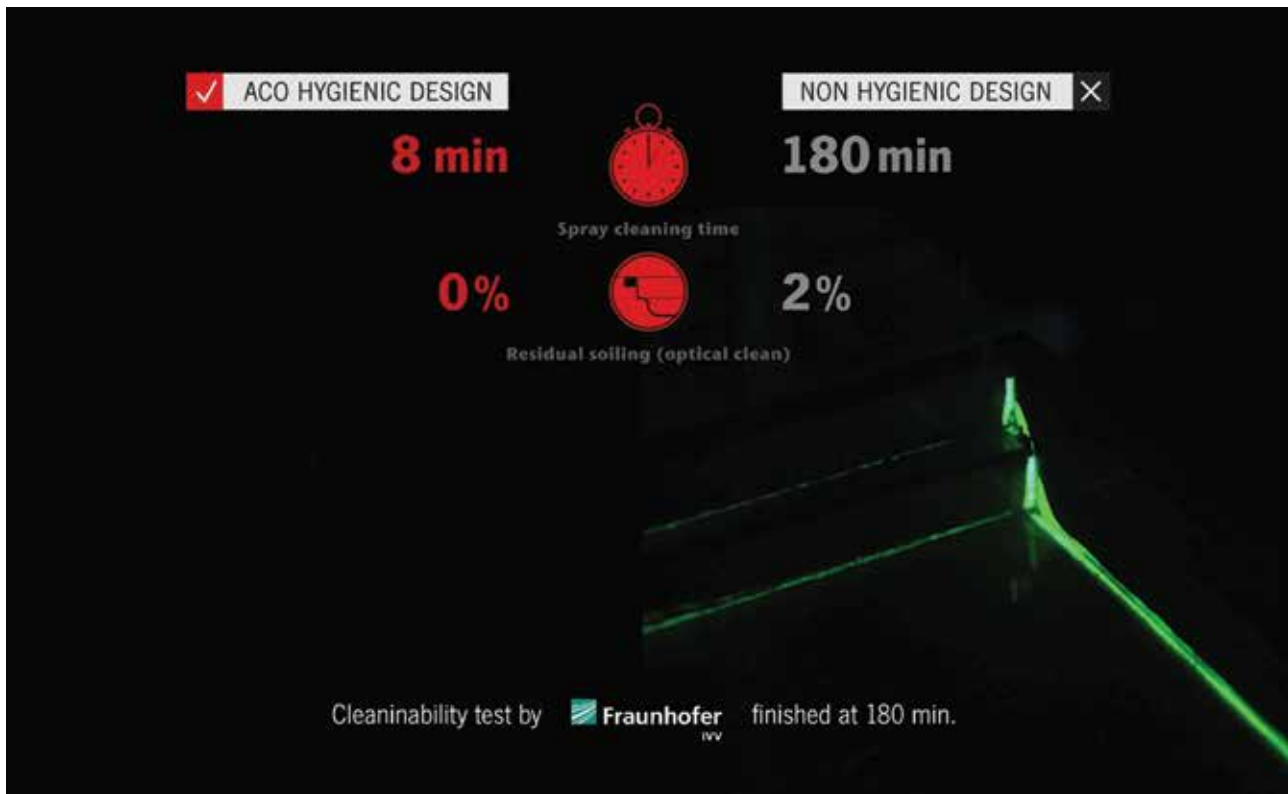
*“A network of drains runs beneath the floors of every food factory. It spreads all over the plant, linking raw and*

*cooked food areas. If the “fall” of the drainage system runs from raw to cooked areas it means that pathogens from raw material and ingredients are flowing just beneath the surface of high risk areas. Because they are always wet and contain food scraps, drains are a perfect area for bacteria to grow. Problem drains are a major source of Listeria in smallgoods plants.”*

Wiley's solution is to design a drainage system that completely separates raw areas from cooked areas so that a backflow of water from raw to cooked can never occur. The drains should be designed to cope with maximum flows during washdown and maintenance. Regular cleaning of drains is vital not only to control bacteria, but also to prevent drain systems from becoming clogged with food scraps and backing up contaminated water.

Moreover, if bacteria are left to build up on the drain, foot traffic through the site can carry contaminants to other parts of the facility which may have a higher risk profile. Or, if high pressure hoses are used for washdown, bacteria can potentially migrate onto walls, the operator, preparation





*The fluorescent green highlights where dirt gets caught in corners of drains after cleaning. A rounded formation shows virtually zero dirt in the same time frame.*

surfaces or equipment and create new sites for bacterial growth.

“In all meat processing facilities you want to be able to protect employees and consumers from the risks of poor hygiene. In any part of the drainage system, the key is to be able to clean surfaces effectively,” says Kate.

Drainage systems that have welds or bends that form a right angle are problematic in that dirt sits in the crevice and standard cleaning techniques and products cannot get into the corners to remove the build-up, which means that bacteria can be left behind.

For example, grates are often designed with overlapping joints, without a fully welded connection. This provides an ideal space for bacteria to thrive in a warm, wet environment – with no tangible way to fully clean the grate. The best design, says Kate, is a fully welded, slip resistant ladder grate which is excellent for high risk areas in slippery environments.

Similarly, channels and gullies can be designed with hard to clean, square internal corners. Ideally, rounded structures are the preferred configuration.

The drainage channel or gully is set into the slab and integrated into the floor finish. The grate sits flush with the channel and floor and collects washdown from the floor surface to discharge it into the pipework. ACO recommends the use of stainless steel as it is non-corrosive, easy to clean,

*continued on page 34*

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*continued on page 33*

non-brittle and suitable for a range of fluid temperatures, particularly hot washdown water.

“Drainage needs to be installed to ensure a full, integrated seal with the floor, otherwise the point where the two meet can become a site for bacteria growth. The pipes that drain the wastewater away also need to be considered, as poor joins or the wrong pipe material can lead to leakage and poor hygiene.”

ACO has spent many years researching the best design for drainage systems to optimise hygiene. The ideal shape for a drainage system is to have rounded edges so that cleaning equipment can remove the dirt build up.

To test the performance of the ACO system, the company commissioned a study to show under scientific conditions how efficient the rounded design is compared to a traditional design with right angle corners. The results show that after cleaning with foam, the ACO-designed channel showed no remaining bacterial growth, while it was clearly evident in the corners of a poorly designed gully.

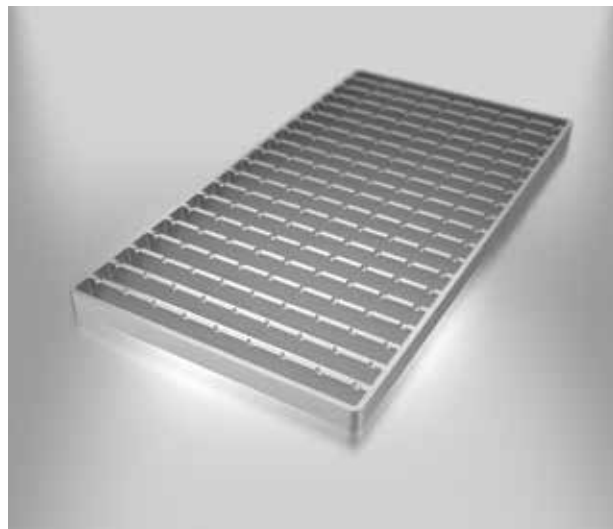
## The Cleaning Ritual

ACO recommend that high pressure hoses not be used in high risk areas due to the likelihood of bacteria travelling large distances with the spray. The recommended procedure to clean a drainage system is:

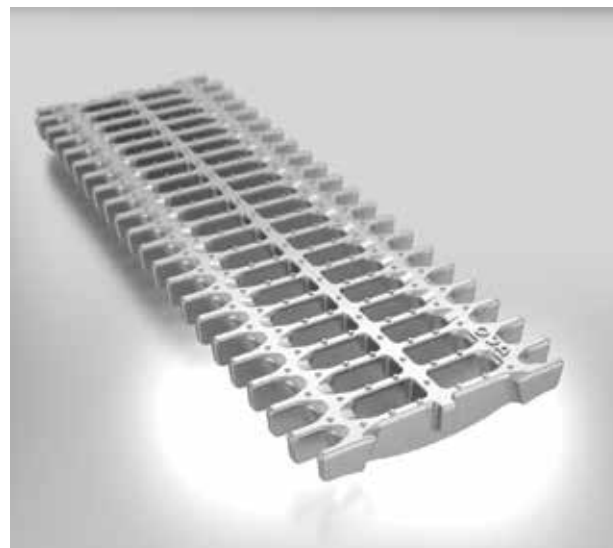
- Remove, store or cover any equipment once it has been thoroughly cleaned
- Clear away any excess material sitting on top of the grate
- Remove the grate
- Remove any traps and strainer basket/s
- Give both the grate, traps and strainer/s a rinse
- Apply the cleaning foam (or cleaning fluid)
- Leave it to soak
- Scrub if needed
- Rinse
- Check for any visual signs of build-up and clean it again if needed
- Return the trap, strainer/s to its correct position
- One final rinse.

The level of cleaning and frequency is determined for the most part by the room’s hygienic risk profile. In areas where food preparation is carried out for ready to eat meals, the moisture level of the food is higher and therefore more likely to encourage bacteria growth in poorly maintained environments.

“Assessing the risk with the HACCP will determine the frequency and depth of the clean,” says Kate. “Regular maintenance and inspection is often overlooked and should be part of the overall cleaning procedure for the floor and drainage system.” ■



*Ladder grates are great design where vehicles will be used in higher risk areas while maintaining slip resistance and still constructed for easy cleaning.*



*A cast grate is robust, gives optimal drainage, slip resistant and suitable for high risk areas in meat processing facility.*



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# Global food systems face challenges ahead

By Stephanie Flynn

The Food and Agriculture Organisation (FAO) of the United Nations has, this year, released the results of its ground-breaking study into global food systems encompassing the entire food chain from production to consumption.

The study, entitled “The future of Food and Agriculture”, has uncovered 15 major trends along the system giving rise to 10 major challenges facing the food and agricultural industries.

According to the FAO these challenges will need to be addressed to guarantee food security for a projected global population of almost 10 billion as we head toward the middle of this century.

It warns that a ‘business as usual’ scenario is not an option for the food and agricultural industries as planetary boundaries may well be surpassed if current trends continue.

In releasing the results of the study, Jose Graziano da Silva, Director-



Director-General of the FAO, Mr Jose Graziano da Silva. © FAO/Alessandra Benedetti

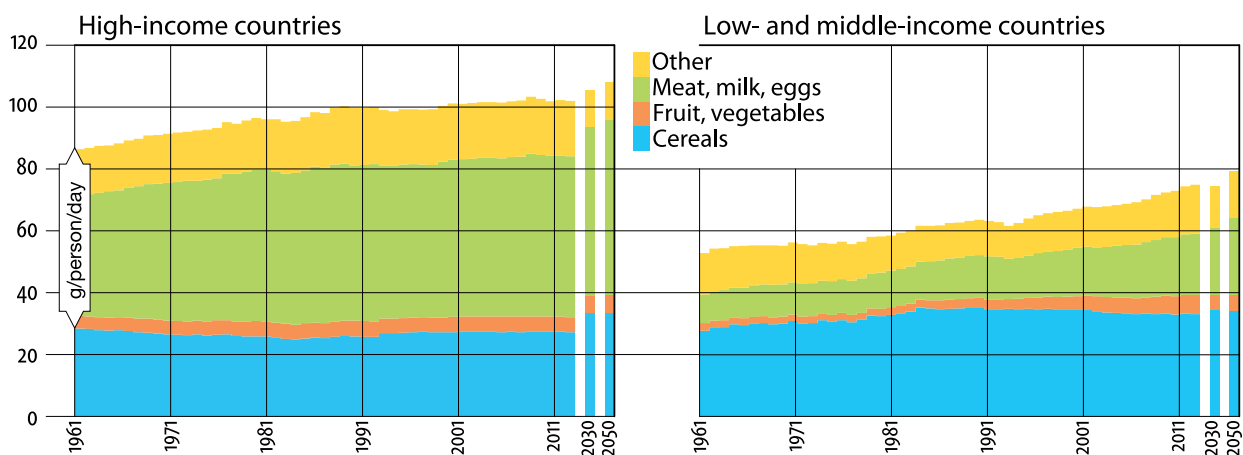
General for the FAO, said that the trends and challenges uncovered by the research team give rise to both hope and concern in the decades ahead.

“Global food security is in jeopardy due to mounting pressures on natural resources and climate change both of which threaten the sustainability of food systems at large,” Mr da Silva said.

“The challenges include: the uneven demographic expansion that will take place over the coming decades, the threats posed by climate change, the intensification of natural disasters, the upsurges in transboundary pests and diseases and the need to adjust to major changes taking place in global food systems.

*continued on page 36*

## Per capita Protein Intake by Source, 1961 – 2050



Source FAO

continued from page 35

“On the hope side of the equation, progress has been made in reducing both hunger and poverty and improving food security and nutrition with gains in productivity and technology having contributed to more efficient resource use and improved food safety,” he said.

What is novel about the study is its focus not only on farming production systems, but also on food delivery systems and consumption, noting several key issues facing all nations including the trend of increasing urbanisation, food waste and malnutrition which also takes in the growing rates of overweight and obesity around the world.

### Changes in Food Systems

Food processing has become a major factor in the transformation of food systems according to the study which notes that food production is changing along with retail channels.

The major changes occurring at the supply end of the food chain include:

- Agriculture and food production are increasingly supplying urban supermarkets;
- Value chains are progressively characterised by vertical integration;
- The automation of large-scale processing; and
- Higher capital and knowledge intensities.

According to the FAO study, between 2011 and 2014, the share of processed food distribution through supermarkets significantly increased in middle income countries from 40 percent to over 50 percent, while at the same time only a slight increase was recorded in high-income countries, from 72 percent to 75 percent.

For fresh food a different picture has emerged with the share of fresh food distributed through supermarkets

remaining below 50 percent in high-income countries and below 30 percent in middle income countries.

The FAO suggests that there is an opportunity to diversify food distribution in the light of emerging forms of e-commerce and emerging consumer preferences for ethical and ecological food.

It notes that while vertically co-ordinated value chains have had a positive impact on the improvement in food quality and safety, thereby benefiting consumer health, there is also a dark underbelly.

Large-scale food processing risks increasing availability of cheaper foods that have high fat content, sugars and salt and longer food chains have a longer ecological footprint.

The FAO details the industry's ecological footprint, noting that as the pressure on scarce land and water resources increase, the agri-food sector must find ways of reducing its environmental impact which includes greenhouse gas emissions, water usage, food loss and waste and its effects on soil health and biodiversity.

It also suggests that food safety and quality standards may lead to the discarding of food that is still safe for human consumption, representing an enormous waste of natural resources.

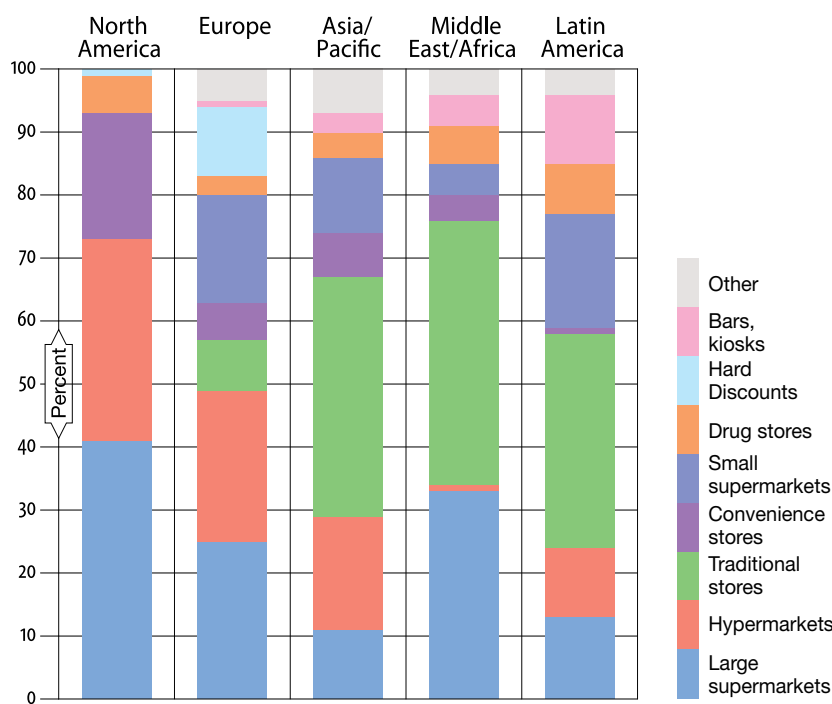
### Food Waste – a burgeoning problem

According to the FAO, globally, around one-third of all food produced is lost or wasted along the food chain from production to consumption and 10 percent of all energy used in the world is for food that is lost and wasted.

The consequences of this inefficiency in food systems result in economic losses for farmers and other stakeholders within the food value chain and higher prices to consumers.

The economic costs of food losses and waste along the food chain differ across regions with 15 percent of food

Share of Food Retail Trade by Channel



Source FAO



losses and waste occurring at the distribution and consumption end of the chain in North America, Europe, Japan and China, compared to only 5.9 to 7.8 percent in South East Asia and Latin America.

Conversely, in Sub-Saharan Africa, 30 percent of food losses occur in the harvest, post-harvest and processing stage compared to only 15 percent in the United States.

In high-income countries food waste is caused mainly by consumer behaviour as well as retailers and consumers over-purchasing and throwing away.

Food waste at retail and consumer levels in the United States alone is estimated 60 million tonnes annually, representing an astonishing 31 percent of the total available food in the food supply chain, while in the European Union that figure is greater still at 100 million tonnes annually.

The FAO concludes that reducing food losses and waste would increase the supply of available food and strengthen global food security and suggests that a re-design of food chains is required with the introduction of sustainable technologies and improved retail models to address the issue.

These levels of food waste are an anathema in a world where millions of people have insufficient food to maintain well-being.

The FAO estimates 795 million people still suffer from hunger and more than two billion suffer from micro-nutrient deficiencies or forms of over-nourishment.

### Malnutrition includes 'over-nourishment' and is Increasing Worldwide

Over-nourishment is one of the key trends uncovered by the study which

the FAO classifies as a major global health emergency.

Overweight and obesity are increasing worldwide in all population groups owing to an increased consumption of foods that are high in energy, fats, sugars and salt and an inadequate intake of fruits, vegetables and fibre according to the report.

The FAO has termed this a 'nutrition transition' which reflects rapid urbanisation globally, increased production of processed foods and more sedentary lifestyles.

The magnitude of this major food-related health crisis is clear in the statistics contained in the FAO study.

In 2014, 40 percent of people aged 18 and over were overweight and 13 percent were obese.

Almost two-thirds of the world's population live in countries where

*continued on page 38*

## ML40-MK / MU / MX Shrink Bags

### The ML40 bone-in range... ... performance at the sharp end.

#### What are ML40 High Abuse Shrink Bags?

Krehalon ML40 high abuse bags are multilayer high barrier, high shrink bags which have been purposely designed for bone-in applications using innovative proprietary technology. Their patented structure provides a unique combination of gas & moisture barrier with superior puncture strength, high clarity & superior sealability to run on all type of vacuum packing systems.

#### Features & benefits

-  **High strength**  
ML40 innovative structure provides in-built puncture protection for maximum strength without the need of boneguard sheets.
-  **Environmentally friendly**  
ML40 chlorine-free technology helps reduce material thickness without compromising on material strength, allowing for thinner but stronger packaging.
-  **Cost efficient**  
The above advantages result in less leakers, better production flow & higher output. For labour cost efficiency, Krehalon also offers a range of high abuse films to run on Shrink Bag Replacement (SBR™) automated systems.

-  **Printable**  
All Krehalon high abuse bags can be offered with up to 10 colour flexographic print for maximum shelf appeal of your product & branding.
-  **Excellent EVOH barrier**  
Krehalon high barrier materials preserve the quality of your product from the point of packing to the ultimate consumer.



#### Interested to learn more?

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#### Applications

-  ML40-MK is a 70 micron shrink bag for medium abuse applications such as hard cheeses, hard dried or cooked meats & bone-in meats (e.g. lamb legs, pork legs & ribs).
-  ML40-MU is a 90 micron shrink bag for high abuse applications such as large hard cooked meats and most bone-in meats (e.g. lamb loins and shoulders).
-  ML40-MX is a 110 micron shrink bag for the most demanding high abuse applications such as large bone-in meats (e.g. beef ribs, lamb saddles & square cut shoulders).

# The 15 trends identified by the FAO study

## 1. Population growth, urbanisation and ageing

- World population growth is slowing

More people now live in urban than in rural areas

World population is ageing

## 2. Global economic growth, investment, trade and food prices

- Projections assume global annual growth rate of 2.7%
- Low and middle-income countries will enjoy faster per capita growth rates than high-income countries
- Trend is toward lower prices for agricultural commodities
- Future levels of food prices will depend on how production accommodates tightening of resources and climate change

## 3. Competition for natural resources

- Growing scarcities of natural resources for agriculture projected to 2050 will drive intense competition for diminishing resources and result in further land degradation, deforestation and an unsustainable level of use of water resources
- Agricultural land is the main driver of 80% of deforestation worldwide
- Shift to bio-energy has implications for agriculture and food production
- Potential for further development of integrated food-energy systems such as mixed food and energy crop systems and biogas from livestock manure

## 4. Climate change

- Increases in frequency and severity of extreme climate events will have greater consequences for agricultural production and food insecurity than higher temperatures and erratic rainfall
- This will contribute to higher food prices by 2050
- Recommendation for research into the effects of climate change on the whole food chain not just production

## 5. Agricultural productivity and innovation

- To meet demand, agriculture in 2050 will need to produce almost 50% more food, feed and biofuel than it did in 2012
- Underinvestment in agriculture and gaps in technology means increasing production will be more difficult than in the past
- The key to sustainable agricultural growth is more efficient use of land, labour and other inputs through technological progress, social innovation and new business models

## 6. Transboundary pests and diseases

- Food security is threatened by an alarming increase in the number of outbreaks of pests and diseases in animals and plants
- Worrying trend is the upsurge in animal diseases with dramatic effects on production, retail prices and consumption and risk of transboundary disease outbreaks is increasing
- More than 70% of infectious diseases in humans since 1940's can be traced back to animals
- Pathogenic Avian Influenza outbreak of 2004 spread to 60 countries, poultry losses amounted to over 300 million birds and economic losses to producers of US\$3.3 billion in the United States alone
- Tick and tick-borne diseases have caused global livestock industry losses of an estimated US\$18 billion
- Main drivers of the pest and disease dynamic is climate change and natural resource degradation

## 7. Conflicts, crises and natural disasters

- Agriculture is already heavily affected by the rising trend in the number and intensity of natural disasters and this trend is likely to intensify
- Conflicts are the main driver of food insecurity and malnutrition
- Conflicts have been on the rise since the early 2000's
- Half the world's poorest live in states characterised by fragility and conflict
- The impacts of climate induced food insecurity are no longer limited to specific regions but have become global
- Today's conflicts are driving mass migrations globally



## 8. Poverty, inequality and food insecurity

- Globally, extreme poverty is decreasing
- Two billion people remain in extreme or moderate-income poverty
- Agriculture is the key to poverty and hunger alleviation in rural areas, but it is no longer enough
- While global inequality is narrowing, within-country inequality is rising in both developing and high-income countries
- The target of eradicating hunger by 2030 will not be reached if current trends prevail

## 9. Nutrition and health

- Weighing on most countries is the triple burden of undernutrition, micronutrient deficiencies as well as overweight and obesity
- Triple burden of malnutrition remains a global health emergency

## 10. Dietary patterns are changing

- In East Asia red meat consumption has increased substantially but has declined in every other region
- Levels of red meat consumption are similar in East Asia, Latin America, North America and western Europe
- The world now produces more than enough food to satisfy the dietary needs of the entire global population

## 11. Structural change (within economies) and employment

- Development of countries is a process of change that transforms the structure of their economies
- The speed and patterns of structural change and agricultural transformation differ across regions
- Expanding populations, income growth and urbanisation have brought changes in the demand for food which has driven the development of agro-industrial production and market chains
- It is estimated that 620 million young people are unemployed globally
- An estimated 600 million jobs will need to be created globally by 2030 to keep employment rates constant

## 12. Migration and agriculture

- Migration is a growing global phenomenon
- Poverty, climate change and competition for natural resources are expected to fuel more distress migration
- High rates of unemployment and under-employment are among the root causes of distress out-migration from rural areas

## 13. Changing food systems

- Food production is changing along with retail channels
- Agri-food sector must find ways of reducing its environmental impact

## 14. Food losses and waste

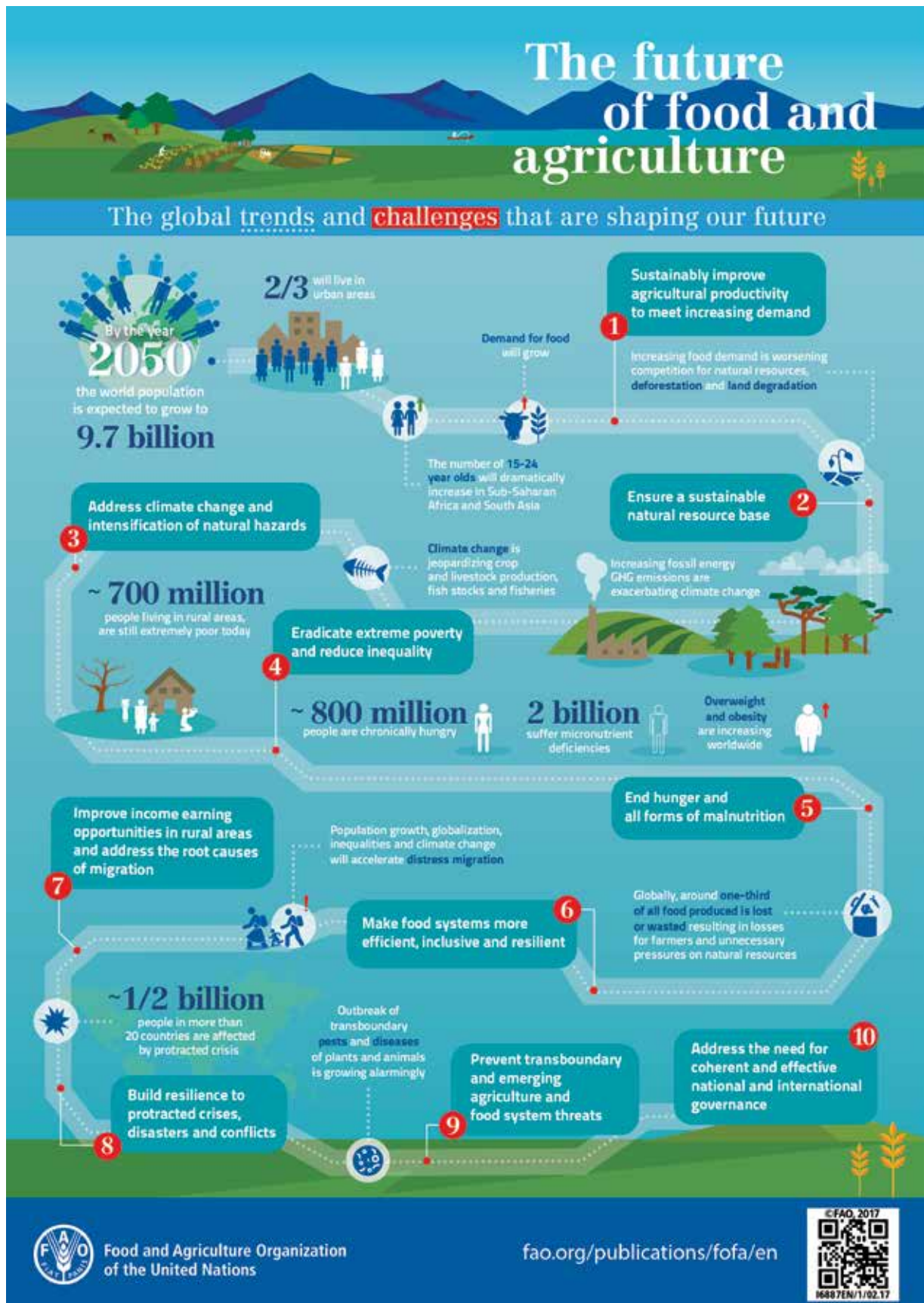
- One-third of all food produced is lost or wasted
- Over-nourishment is a problem on the rise
- Governance for food and nutrition security
- The importance of Governance was stressed with the adoption of the 2030 Agenda for Sustainable Development
- Under the Agenda, all countries are 'developing countries' and have a collective responsibility for sustainable development
- No country is, today, on a sustainable pathway

## 15. Development finance

- Investment in food and Agriculture is one of the most effective means of stimulating economic growth and reducing poverty and is essential for ending hunger and malnutrition
- The landscape of development finance is changing
- International private finance is growing in importance for low-income countries
- The public sector is not a major investor but its role is crucial in developing rural infrastructure and public services
- A growing trend is the emergence of partnerships between the public sector, private sector and communities
- More than 90% of the estimated 570 million farms worldwide are family farms

*continued on page 40*

continued from page 39





overweight and obesity kill more people than underweight and, by 2025, the FAO estimates that 11 percent of the world's children under five years of age will be overweight.

These figures reflect the fact that dietary patterns are changing globally with the consumption of highly processed foods having increased more than the consumption of fresh foods.

## Meat Consumption on the Rise

For the meat industry, the picture is a positive one in the decades ahead as per capita intake of protein from animal products continues to rise in low and middle-income countries.

In all regions globally, the consumption of processed meat has increased.

While protein intake from animal sources has remained constant at around 52kg per person in high-income countries since the 1980's, in low and middle-income countries it is expected to continue to rise from the 20 grams per person recorded in 2011 to 25 grams per person by 2050 leading the FAO to suggest that the trend is toward accelerated growth in the consumption of meat.

Advances in agricultural productivity and food supply in recent decades has led the FAO to conclude that the world now produces more than enough food to satisfy the dietary needs of the entire global population, but for it to continue to do so, will be major a challenge requiring major changes by the food industry from production through to retail channels.

The FAO has drawn several key conclusions for food security over the next 30 years.

Overall the demand for food will continue to increase and will do so in the context of increasing scarcity of natural resources and important changes in the structural composition

of the demand for food and agricultural products as the world becomes increasingly urbanised.

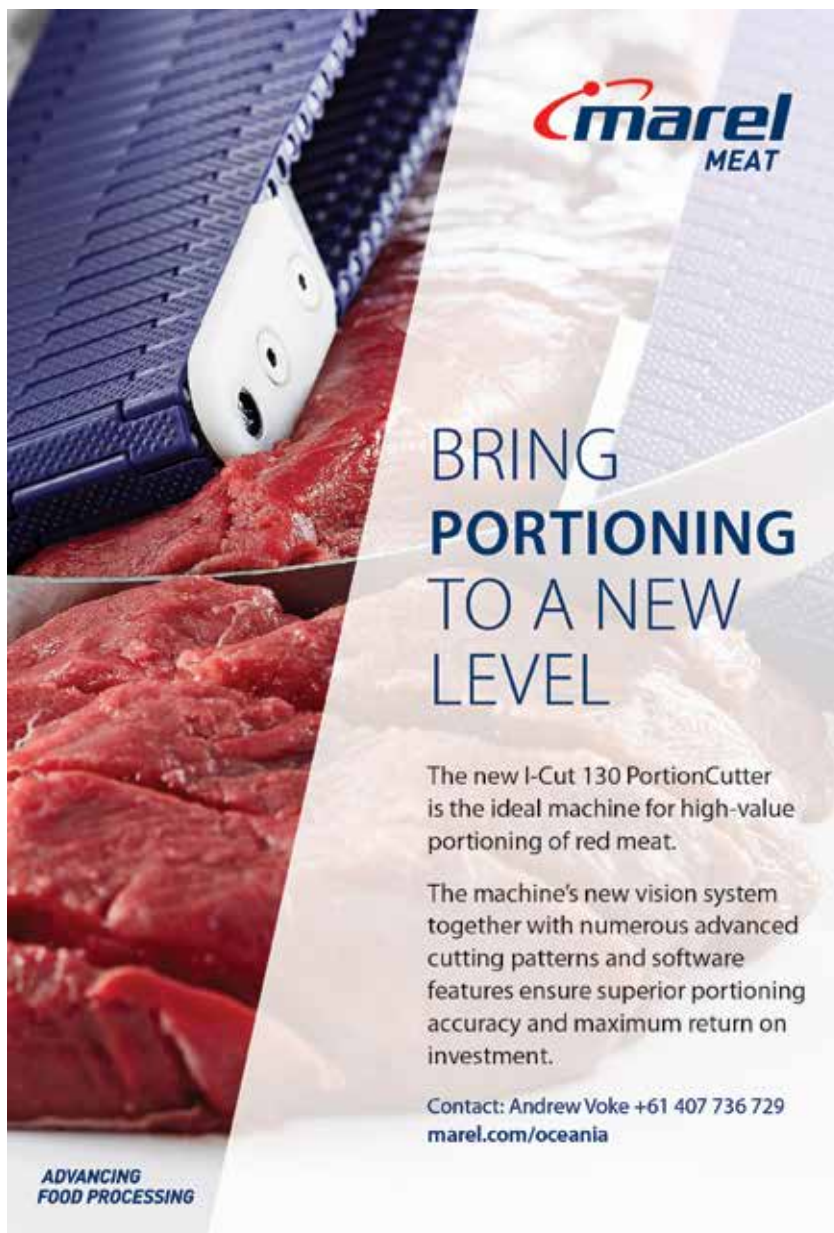
Problems of extreme poverty, hunger, food insecurity and undernourishment will persist along with increases in overweight, obesity and diet related chronic illnesses.

Natural disasters are increasing in number and intensity and, along with climate-related extreme weather events, are expected to deepen the

need for humanitarian assistance and resilience building in rural areas.

Transboundary pests and diseases and other emerging threats will continue to provoke crises in agricultural and food systems and impact productivity and human health.

More investment in agriculture and agri-food systems is needed to enhance agricultural productivity and promote innovation for sustainable agriculture and food security. ■



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# FIND A WORD

## TO WIN one of six VICTORY knives

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### food processor supplies

The words in the list below are all hidden in the grid. They may be found in straight lines running horizontally, vertically or diagonally. Some of the letters are shared by more than one word. When you have found all the words in the list, there will be 32 letters remaining: these form the answer to the competition.

#### ENTRIES CLOSE: 10 FEBRUARY 2018

First prize is a Victory 10" Simitar steak knife with a Lesnie's Steel. Five Victory 6" narrow curved boner knives are also up for grabs! To enter, find the words, cut out or copy the page or just send the answer with your name and address and contact details to: Find a Word, Australian Meat News, PO Box 415 Richmond Vic 3121 or scan and email to: [optimalnews@majestic.net.au](mailto:optimalnews@majestic.net.au)

Be sure to write your name, address and phone number and ANSWER clearly.

Last issues winners see page 43

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### Publishing Schedule 2018

Edition	Booking Deadline
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MAY	April 20
JULY	June 15
SEPTEMBER	August 15
NOVEMBER	Oct 17
MARCH 2019	Feb 13

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### Winners of the September 2017 Find a Word Competition

Congratulations to the winners and thank you  
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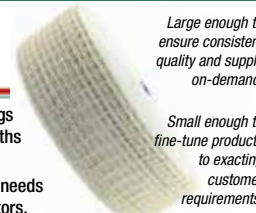


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### Book Competition Winner

Congratulation to Don Fulton, from  
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who has won a copy of *Heat and  
Smoke* by Bob Hart. Don correctly  
answered "140" to the question:  
*What anniversary did EKKA  
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