THE NATIONAL
PROVISIONER
130 YEARS OF EDITORIAL LEADERSHIP IN THE MEAT & POULTRY INDUSTRY

AUGUST 2021

2021 BEEF Report

ALSO IN THE ISSUE:

BEEF PLANT OF THE FUTURE
2021 CROP REPORT
FILMS & BARRIER TECHNOLOGY

PROVISIONERONLINE.COM
A bnp media Publication

Making our world more productive

Remove the heat. Improve the mix.

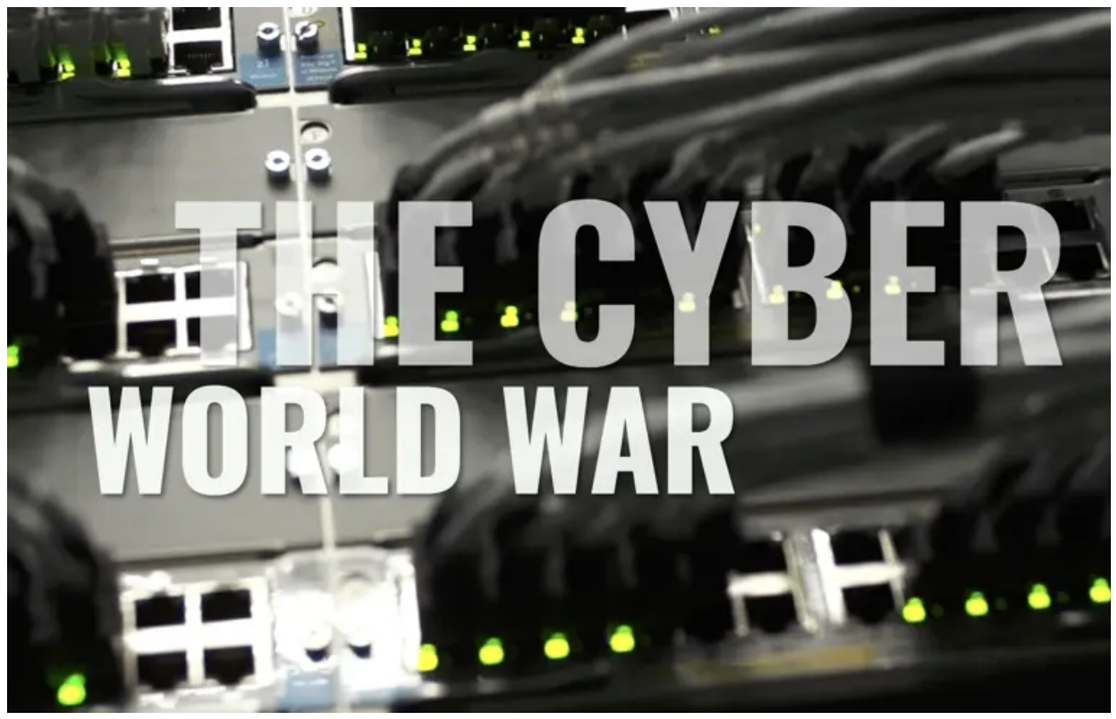
Temperature control helps maintain the quality of blended meat.

Chilling meat during the mixing or grinding process inhibits bacterial growth, preserves product texture, and assures a proper blend. Consistent temperature is also essential for making formed products with uniform dimensions and weights. Linde ACCU-CHILL® cryogenic chilling systems efficiently remove heat during mixing — helping to promote product quality and boosting throughput. Our chilling experts can configure the system that is optimal for your operation.

Visit **lindefood.com/meatmixing** for more information on ways Linde can help improve your process.

CONTENTS

AUGUST 2021
VOLUME 235 / ISSUE 8



COVER STORY

DEPARTMENTS

FEATURED CONTENT

TECH TOPICS

NEW FROM NATIONAL PROVISIONER VIDEOS

The Los Angeles Dodgers recently announced a multi-year partnership with Papa Cantella's to supply Dodger Stadium with Dodger Dogs and premium sausages. Tony Cantella, company president, overviews the new offerings and discusses how this partnership compares to others, mostly in retail and foodservice.

CHECK OUT OUR AWARD-WINNING ONLINE VIDEOS

AN EXISTENTIAL THREAT TO YOUR BUSINESS

BY SHAWN K. STEVENS
FOOD INDUSTRY COUNSEL LLC

A recent spate of high-profile ransomware attacks has caught many off guard. Unfortunately, this sort of attack is in its relative infancy. As the criminal groups that engage in these attacks continue to become more creative, sophisticated and numerous, the threat will only become more acute. To protect their brand, companies should immediately take action to secure their networks and keep them secured.

What is ransomware?

Ransomware is a type of computer program (often called malware), surreptitiously delivered onto a computer or network, that is designed to encrypt all the files. By encrypting the files, any files and the systems they rely on are rendered unusable and inaccessible without a password. Criminal actors then demand ransom in exchange for the decryption password.

Cyber threats are constantly evolving, and cyber criminals are becoming increasingly sophisticated in their modus operandi. Given the global nature of the meat industry, companies need to be highly automated and work across very large and difficult-to-secure networks. This makes the meat industry particularly vulnerable and often targeted. Today, nearly every aspect of meat production is integrated through online networks. This includes systems to maintain facilities, equipment, production, distribution and food safety.

To make matters worse, online threats are extremely difficult to protect against. The threat matrix is constantly changing, and criminals are skilled at adapting new methods to carry out their crimes. There are steps, however, companies can take to address the risks. Most important is to be prepared. Time is of the essence if your company is to be able to manage the risk posed by ransomware and support your company's ability to deliver a coordinated and efficient response to a ransomware incident.

From an infrastructure standpoint, one critical step is to modernize your network and implement stronger cybersecurity standards. This includes implementing offline, encrypted backups of data. The backups should be regularly tested and conducted on a regular basis. Backups must be maintained offline to protect them, as criminals will seek to locate and delete any backups in advance of launching the main attack. In other words, the criminals know there is no need to pay ransom for data that you maintain easy access to by storing offline.

Next, create a cyber incident response team and associated crisis plan that includes response and notification procedures in the event of a ransomware incident. The Public Power Cyber Incident Response Playbook is a great resource for developing such a plan. Understanding your vulnerabilities is also a key aspect of addressing risk. The federal government's Cybersecurity and Infrastructure Security Agency offers a no-cost Vulnerability Scanning service and other no-cost assessments here: https://www.cisa.gov/cyber-resource-hub

Adopting Zero Trust Architecture is another means that companies can take to bolster the security of their systems. Criminals often gain initial access to a network through exposed and poorly secured remote services and later propagate ransomware. See CISA Alert AA20-073A, Enterprise VPN Security. So, rather than conventional "perimeter security," zero trust architecture treats all users as potential threats and prevents access to systems and data until the user has been properly authenticated.

It is critical for companies to work now to secure against devastating cyberattacks, including those from ransomware and other malware. It is by no means an overstatement to say that the action you take today may ultimately make the difference in the survival of your company tomorrow. The threat posed by cyber criminals is one that has existential implications for companies and looks to become worse over time.

ROBOTIC HOG SPLITTING -
the next generation

JARVIS
AUTOMATION

CUTTING EDGE TECHNOLOGY FROM JARVIS // relentless uptime

ACCURACY // improved yield

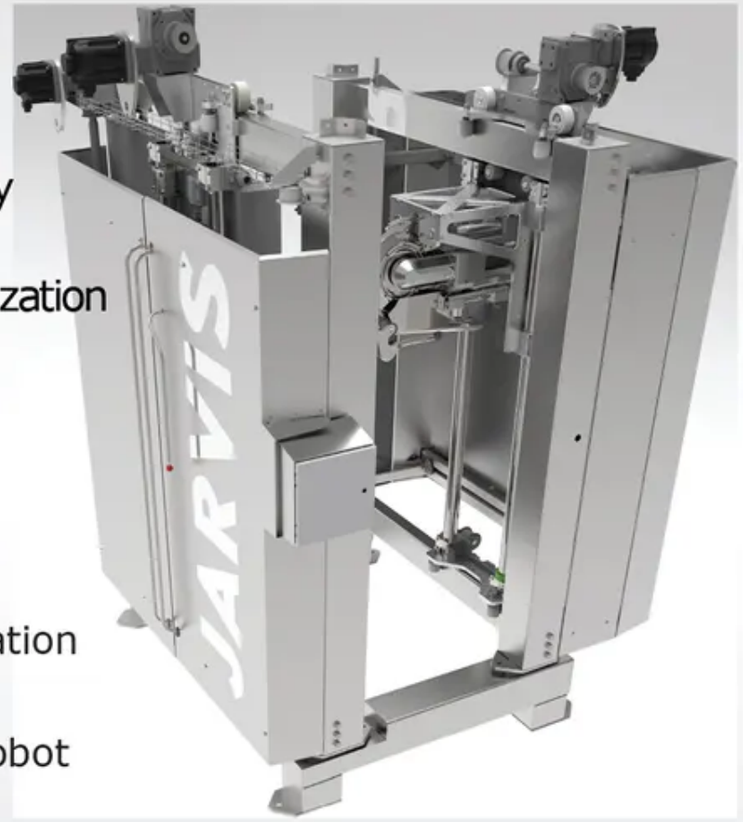
TCO // low maintenance

INTUITIVE // operator friendly

HYGIENIC // integrated sanitization

CLEAN // swarf control

RELIABLE // ready for action



contact:
Jarvis Products Corporation

for information on the:
Jarvis JLR900 Linear Robot
for hog splitting

JARVIS MODEL JLR900

PROVEN PERFORMANCE // 855 per hour

JARVIS
World Leader in Meat Processing Equipment

Jarvis Products Corporation
33 Anderson Road, Middletown, CT 06457
Telephone: (860) 347-7271
Fax: (860) 347-9905
E-mail: sales@jarvisproducts.com
Website: www.jarvisproducts.com

READY TO Sizzle

BREAKFAST AND DINNER SAUSAGES EXPLODE IN POPULARITY DURING THE PANDEMIC.

BY MEGAN PELLEGRINI

What's summer without a hot dog or brat? These staples of the backyard party, baseball games or Fourth of July gatherings are more popular than ever — especially as Americans look forward to long-awaited family reunions.

"I think the future for sausage is bright," says Anne-Marie Roerink, principal and founder of 210 Analytics, in San Antonio, Texas. "While every protein in the meat department will have a hard time lapping the results of 2020, demand continues to sit comfortably above the 2019 pre-pandemic normal. Add to that that Americans are ready for a re-do on all the missed celebrations, family and friends' get-togethers and the massive investments made in all things grill and smoker, and I think we're going to see a very strong barbecue season this summer."

Both breakfast and dinner sausage have been on multiyear growth trends, so the explosion in sales that we witnessed during the pandemic is really an acceleration of a trend that we had already been seeing, Roerink says.

> BOTH BREAKFAST AND DINNER SAUSAGE HAVE BEEN ON MULTIYEAR GROWTH TRENDS, SO THE EXPLOSION IN SALES THAT WE WITNESSED DURING THE PANDEMIC IS REALLY AN ACCELERATION OF A TREND THAT WE HAD ALREADY BEEN SEEING.

"Dinner sausage is the bigger of the two — at 2020 sales of $4.7 billion — which was an increase of 21 percent over year ago, according to IRI for the multi-outlet universe," says Roerink. "But this is on top of a 2.6 percent increase in 2019 and up 2.1 percent in 2018. And this goes hand-in-hand with solid increases in volume also."

In 2020, breakfast sausage totaled $2.1 billion, which was a 20 percent increase year over year, after gaining 1.8 percent in 2019 and 3.7 percent in 2018. "So, these are certainly numbers that point to strong and growing offerings," Roerink says. "And that makes all the sense in the world as they are versatile, convenient, easy-to-prepare and kid-friendly items — which is exactly the type of items that have been doing well."

But according to Chicago-based IRI, an analytics firm, the average assortment per store of dinner and breakfast sausage has dropped from 92.7 items in 2017 to 86.5 items in 2020.

"I believe dinner and breakfast sausage may be an interesting segment for retailers to review, especially for limited-time offers of fun, new flavors or cross-merchandised solutions," says Roerink. "For instance, Publix had a wonderful breakfast endcap the other day, with all the items ranging from orange juice and coffee to bacon and breakfast sausage."

ON THE MENU: NEW, UNIQUE FLAVORS

Sausage is popular with diners because it's versatile, flavorful and unique. About 53 percent of operators have sausage on their menu, according to Technomic's Ignite menu data, says Lizzy Freier, managing editor at Technomic, a Winsight Company, based in Chicago.

"Though incidence is down slightly on menus — no surprise given menu streamlining amidst the past year due to the pandemic — sausage mentions are up in certain items, including mixed protein bowls (up 120 percent year over year), breakfast quesadilla entrees (up 60 percent), breakfast bowls (up 33.3 percent) and build-your-own combos (up 32.1 percent)," says Freier.

And consumers are interested in buying more pork options. "Data from Technomic's 2021 Beef and Pork Consumer Trend Report shows that 37 percent of pork consumers would order regular or smoked sausage at least occasionally (once every 90 days)," says Anne Mills, director at Technomic, noting the survey included 1,034 consumers who eat pork once every two to three weeks. "This is higher among consumers ages 25 and older (41 percent) than 18 to 34 (30 percent)." The report found that there is substantial demand for unique pork options; 39 percent of consumers would like restaurants to offer pork entrees with new, unique flavors and 35 percent of consumers are interested in trying pork dishes made with global flavors/ingredients, says Mills.

"Demand is relatively stable compared to 2018 and is driven by younger consumers, who are generally more adventurous eaters," Mills says. Plant-based meat alternatives aren't going away, and consumers are willing to try new varieties. "Beyond beef patties, we're seeing plant-based substitutes expand into other categories, and 42 percent of pork consumers say they would be likely to try a plant-based pork alternative if available," says Mills, citing the same survey.

WINNING ON TASTE

In 2020, IRI reports pork sausage sales represented over 60 percent of all retail sausage sales and outpaced the total sausage category in growth for the 52 weeks ending Dec. 27, 2020, says Jason Menke, director of marketing communications at the National Pork Board (NPB), based in Des Moines, Iowa.

"Pork sausage wins on taste, with half of consumers noting that pork sausage is delicious and saying it is something they love eating," says Menke, referencing NPB At Home Meat Tracker, April 2021.

Younger shoppers have a higher affinity for pork sausage. "More than 70 percent of Gen Z note that it tastes delicious, and half of them also note it is less involved to cook than other meat," says Menke.

Traditional flavors tend to be most popular for both breakfast and dinner sausage. And while uncooked makes up the majority of sales, growth has been fueled by fully cooked and ready-to-eat sausage, says Menke.

FOCUSING ON HEALTH

Sausage is certainly a traditional comfort food, but new offerings are focused on health. Varieties include organic, chicken-based sausages and products that have added ingredients, such as apple sausages.

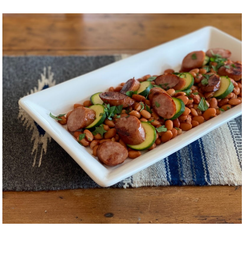
In addition to natural ingredients, sausages have also innovated with the types of protein used, blended sausages, new flavors, formats and packaging in the past five years. "In terms of proteins, innovation runs the gamut from plant-based meat alternatives to seafood and chicken. The innovation in chicken sausage is particularly exciting as it brings a different health positioning and many interesting new flavor combinations," Roerink says.

"Last year when supplies on the shelf were low, people may have bought sausages, hot dogs and other cuts of meat they normally would not have," says Sarah Findle, director of marketing and communications at Coleman Natural Foods, in Denver, Colo. "This unexpected trial has resulted in consumers understanding that natural sausages made with clean ingredients are a great source of protein, provide great taste and can be used for multiple eating occasions."

Several brands now carry protein callouts as well as clean-label callouts such as organic, no artificial colors or flavors or non-GMO, Roerink says. "We see antibiotic-related claims come into the sausage segment also," she says. "And on the packaging side, I'm encouraged to see more and more vacuum-sealed packaging. This allows for much longer shelf life in store as well as at home, as well as being freezer ready as we continue to see people take fewer trips while buying more each trip."

In the end, consumers care more about quality and value than trends. "Shoppers today want to make sure when they do spend money, they are buying quality food they feel good about feeding their family," Findle says. "Consumers want to be confident in where their food is coming from and will be looking for meat products raised and processed in the U.S. on farms that care about the humane treatment of their animals."

Consumers' newfound confidence in cooking at home, which may have been discovered during the pandemic, is ready for old and new favorites this summer. "As grilling season hits its height, we'll be suggesting new preparation styles and recipe ideas that will make meals and gatherings even more memorable," Findle says. "We want to inspire people to go 'beyond the bun' with sausage recipes like skillet dishes, salads, and appetizers."



Food Safety Assessments, HACCP Plans & Electronic Records...

MADE EASY!

When you work with We R Food Safety!, you gain a LONG-TERM PARTNER!

- YOU save money by reducing loss due to process deviations
- WE install our Food Safe Pro! software and train you
- YOU gain access to our consultants and their unmatched expertise
- WE assess your food safety data regularly and report concerns EARLY!
- YOU can maintain and access food safety documents and records easily
- WE don't simply install and walk away! We are **THERE FOR YOU!**

Click, email or call now for a free, no-obligation demo showing how we can help keep your customers safe, regulators happy and business operating efficiently!

We R Food Safety!

info@werfoodsafety.com | Ph: (715) 309-2980 | Toll Free: (855) 444-5315 | www.werfoodsafety.com

2021 FEED INGREDIENT PRICES

AMONG THE HIGHEST IN THE LAST DECADE

BY DAN EMERY
CEO MEANINGFUL SOLUTIONS

No two years in farming are alike or free of drama.

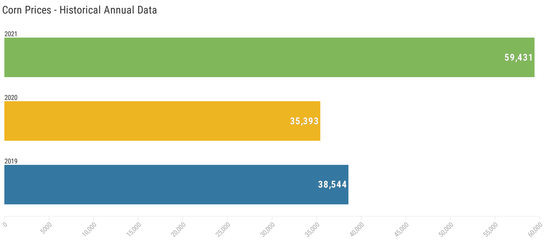
This year there is a dramatic reduction in supply, a drought in parts of the corn belt and the significant increase in oil prices. So far there are some concerning issues with our crop conditions caused by a drought in parts of the corn belt and the Southwest. This year's corn and soybean meal prices will be among the highest in the last decade. The core of this problem goes back to 2019 when the corn and soybean carryover in the market was dramatically reduced by a late planting resulting in a poor crop. The crop conditions in Brazil are also a factor. Additional unusual global consumption patterns in 2020 further eroded carryover supplies. If there are any major issues such as continued lack of rain in July, we could have an even more severe situation, because the market does not have the usual supply carryover to cushion an event.

In the protein business, feed ingredients are more than 50% of our cost. Even with the latest report we are scheduled to only carry more than 1 billion bushels of corn, which is the least in many years. The challenge of writing this report every year is July is the most critical month and typically we are not privy to the rain totals before this is sent to press. An example is 2011 when we were coasting right along and then the month of July was dry as a bone and we had a poor crop. This resulted in the last major price spike.

We have expressed long-term concerns about our farmers and their ability to continue supply the feed ingredients we need on a cost-effective basis. About 70% of the farmland is going to change hands in the next 15 years. This means the next generation of farmers needs to take control and continue to produce the crops we need to feed our animals and supply ingredients for our baked goods. Additionally, experts are genuinely concerned that we continue to lower our water tables and 10 years from now will have significant challenges with the water supply.

Some areas of the U.S. are facing significant water stress. These areas include Nebraska, Colorado, California, Delaware, Ohio, Virginia, North Carolina, Arkansas and the entire Southwest. As an industry, we need to improve our stewardship of water use, returning it back into supply in the form of potable water. We also need to protect adjacent waterways. I will be personally partnering with folks who have disruptive technology that will help us reclaim water.

On June 30, the U.S. Department of Agriculture's National Agricultural Statistics Service (NASS) estimated 92.7 million acres of corn planted in the United States for 2021, up 2% from last year, according to the recently released acreage report. Soybean area planted is estimated at 87.6 million acres, up 5% from last year. Following up to the Prospective Plantings report released in late spring, NASS surveyed more than 90,000 farm operators during the first two weeks of June to gather information on what farmers actually planted.



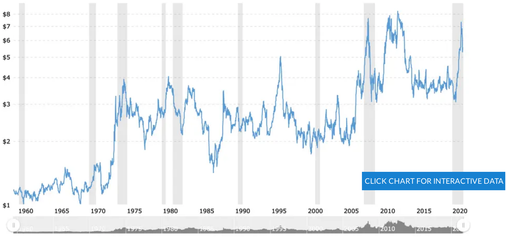
Key findings in the acreage report include:

- **Corn:** Growers expect to harvest 84.5 million acres of corn for grain, up 2% from last year. Ninety-three percent of all corn acres planted in the United States are biotech varieties, up 1 percentage point from last year.
- **Soybeans:** Harvested area for 2021 is estimated at 86.7 million acres, up 5% from 2020. Producers planted 95% of the soybean acreage using herbicide-resistant seed varieties, 1 percentage point higher than in 2020.
- **Wheat:** All wheat planted area for 2021 is estimated at 46.7 million acres, up 5% from last year. This represents the fourth lowest all wheat planted area on record since records began in 1919. Winter wheat planted area is estimated at 33.7 million acres, up 11% from 2020. This marks the first year of increasing acreage since 2013. Other spring wheat planted areas are estimated at 11.6 million acres, down 5% from 2020. Durum wheat planted area is estimated at 1.48 million acres, down 12% from last year.

The NASS also released the quarterly Grain Stocks report to provide estimates of on-farm and off-farm stocks as of June 1. Key findings in that report include:

- Corn stocks totaled 4.11 billion bushels, down 18% from the same time last year. On-farm corn stocks were down 39% from a year ago, but off-farm stocks were up 11%.
- Soybeans stored totaled 767 million bushels, down 44% from June 1, 2020. On-farm soybean stocks were down 65% from a year ago, while off-farm stocks were down 27%.
- All wheat stored totaled 844 million bushels, down 18% from a year ago. On-farm all wheat stocks were down 38% from last year, while off-farm stocks were down 12%. Durum wheat stored totaled 27.5 million bushels, down 34% from June 1, 2020. On-farm stocks of Durum wheat were down 24%, while off-farm stocks were down from the previous year by 42%.

CORN PRICES - 59 YEAR HISTORICAL CHART



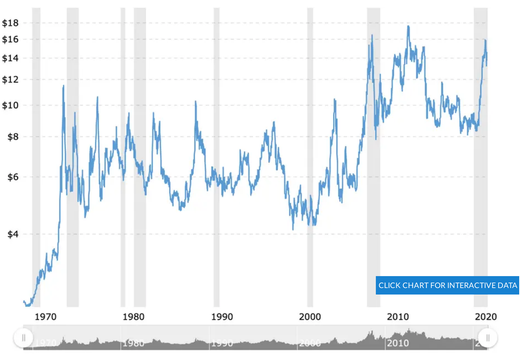
The Acreage and Grain Stocks reports and all other NASS reports are available online at www.nass.usda.gov.

If you follow a five-year trend, grain-based feed ingredients including corn, wheat and soybeans prices travel within a pricing range of one another. Their price also correlates to the price of oil. Estimating and gaining some control over that cost is always an important factor in a successful or unsuccessful year for good companies in the protein business. Ethanol production continues to get more and more efficient, maximizing the energy extracted from every bushel of corn. Ethanol is now the No. 1 consumer of corn with animal feed ingredients closely behind in second.

Crude oil markets are back into the $75 per barrel range caused by OPEC moderating production during the pandemic and a recent increase in consumption.

In summary, this will be another interesting year. Frozen meat stocks are at an all-time low. Restaurants continue to reopen but we are facing another round of COVID-19 with the delta variant sweeping around the world. African swine fever is popping up all around the world including China, and avian influenza continues to be an issue in certain countries. Consumers will continue to eat record amounts of meat, and I commend your efforts to continue to feed them despite all the adversity.

SOYBEAN PRICES - 45 YEAR HISTORICAL CHART



IMPACTS OF IN UTERO HEAT STRESS ON CARCASS AND MEAT QUALITY TRAITS OF PORK LOINS

BY MARIAH NONDORF[1], JACOB R. TUELL[1], JACOB MASKAL[1], JAY S. JOHNSON[2], AND YUAN H. BRAD KIM[1*]

1 MEAT SCIENCE AND MUSCLE BIOLOGY LABORATORY, DEPARTMENT OF ANIMAL SCIENCES, PURDUE UNIVERSITY, WEST LAFAYETTE 47907, IN, USA
2 USDA-ARS LIVESTOCK BEHAVIOR RESEARCH UNIT, WEST LAFAYETTE, IN 47907 USA
*CORRESPONDING AUTHOR: YUAN H. BRAD KIM

Postnatal heat stress costs the U.S. livestock industry approximately $2 billion annually (St-Pierre et al., 2003), with about $1 billion attributed to swine specifically (Pollman et al., 2010).

Swine are particularly prone to experiencing heat stress, because they lack functional sweat glands, have a thick layer of subcutaneous fat and a large body size. Consequently, heat stress has proven to cause reduced animal performance and typically results in smaller, leaner carcasses (Cruzen et al., 2015). But the impact of heat stress may extend beyond what pigs experience postnatally. Gestating sows are even more susceptible to experiencing heat stress because of increased metabolic heat production that occurs as pregnancy progresses. This in utero heat stress may add to the negative economic outcomes of what is normally considered as heat stress.

The known effects of IUHS are negative impacts on growth and performance (Renaudeau et al., 2012; Cruzen et al., 2015; Johnson et al., 2020), including smaller, leaner carcasses, smaller loin muscle area, increased backfat thickness and altered energy metabolism in swine. This may be related to longer-lasting metabolic changes that result from IUHS, especially in early gestation (Cruzen et al., 2015; Johnson et al., 2018). While some studies have found that offspring that have experienced IUHS may exhibit inferior performance, it is largely unknown what effects IUHS may have on meat quality attributes.

To address this, researchers from the Purdue Animal Sciences department in conjunction with the U.S. Department of Agriculture's Animal Research Service (USDA-ARS) Livestock Behavior Research Unit evaluated the impact of IUHS on the carcass and meat quality attributes of gilts having undergone IUHS. For the study, 24 pregnant gilts were either assigned to a thermoneutral (17.5 ± 2.1 °C; 70.2 ± 8.8% relative humidity) or heat stress (35.8 ± 0.2 °C day and 28.4 ± 0.2 °C night; 80.9 ± 6.0% relative humidity) environmental chamber during the first half of their gestation (from day six after insemination to day 59 of pregnancy). All pregnant gilts were then exposed to thermoneutral conditions from day 60 of their pregnancy through farrowing their litters. After the offspring reached market weight, gilts (n=10/treatment) were selected from the in utero thermoneutral group (IUTN) and IUHS group and were harvested. Carcasses were chilled at 2°C for 24 hours prior to evaluation and collection of the right-side loin muscle. From these, sections were cut and assigned to aging treatments of either no further aging or seven days of wet aging at 2°C in vacuum packaging. From the sections, chops were cut to measure Warner-Bratzler shear force (WBSF), surface meat color, water-holding capacity (WHC), and other chemical attributes such as fatty acid profile, lipid oxidation and protein denaturation.

In comparing the effect of different in utero environments on carcass composition and quality, the carcasses from the IUHS treatment had lower head and heart weights ($P < 0.05$) compared with the IUTN group. The IUHS treatment also significantly decreased the loin muscle area ($P < 0.001$). This may be because of impaired muscle development during fetal development, meaning there are fewer muscle fibers in the muscle (Cruzen, 2015). Additionally, the IUHS treatment increased WBSF values ($P < 0.05$), indicating the meat may be tougher compared with IUTN counterparts. Other measures including temperature and pH decline, WHC, surface color, fatty acid profile, lipid oxidation and protein denaturation were not affected by in utero environment ($P > 0.05$).

These results can suggest that IUHS has a negative impact on some carcass and meat quality traits; however, there appeared to be limited impact on other traits including pH, color, WHC and antioxidative capacity. Taken together, minimizing IUHS during the first half of gestation could be advantageous to producers to produce higher yielding carcasses with superior meat quality.

REFERENCES

Cruzen, S. M., R. L. Boddicker, K. L. Graves, T. P. Johnson, E. K. Arkfeld, L. H. Baumgard, J. W. Ross, T. J. Safranski, M. C. Lucy, and S. M. Lonergan. 2015. Carcass composition of market weight pigs subjected to heat stress in utero and during finishing. J. Anim. Sci. 93:2587-2596.

Johnson, J. S. 2018. Heat stress: impact on livestock well-being and productivity and mitigation strategies to alleviate the negative effects. Anim. Prod. Sci. 58(8):1404-1413.

Johnson, J. S., K. R. Stewart, T. J. Safranski, J. W. Ross, and L. H. Baumgard. 2020. In utero heat stress alters postnatal phenotypes in swine. Theriogenology. 154:110-119.

Pollman, D. S. 2010. Seasonal effects on sow herds: Industry experience and management strategies. J. Anim. Sci. 88:9. (Abstr.).

Renaudeau, D., A. Collin, S. Yahav, V. de Basilio, J.L. Gourdine, and R.J. Collier. 2012. Adaptation to hot climate and strategies to alleviate heat stress in livestock production. Animal. 6(5):707-728.

St-Pierre, N. R., B. Cobanov, and G. Schnitkey. 2003. Economic losses from heat stress by US livestock industries. J. Dairy Sci. 86(Suppl.):E52–E77.

JARVIS®

Model JR-50 Robotic Beef and Hog Hock Cutter

- Robotic beef and hog hock cutter for automatic hock cutting on the kill floor.
- Higher line speeds and more precise and consistent cuts.
- Small footprint to conserve slaughter line operating space.
- Easy to clean and maintain.

JARVIS®

World Leader in Meat Processing Equipment

View Jarvis tool information on our website

Jarvis Products Corporation
33 Anderson Road, Middletown, CT 06457
Telephone: (860) 347-7271
Fax: (860) 347-9905
E-mail: sales@jarvisproducts.com
Website: www.jarvisproducts.com

BLENDING TOGETHER

PROCESSORS CAN UTILIZE OLD AND NEW METHODS FOR BLENDING AND FAT ANALYSIS.

BY MEGAN PELLEGRINI
CONTRIBUTING WRITER

"Not all beef trim is created equal," says Christopher Kerth, Ph.D., associate professor of meat science at Texas A&M University, based in College Station, Texas.

When creating optimum blends (and analyzing their fat content), the meat sample – and source – can certainly affect results and flavor. And the type of fat in the meat can be just as important as the amount. To create ideal meat blends, processors today are playing with the fat source and utilizing old and new methods of analysis.

To start, the cut itself plays a big role in the product's flavor. It matters where the cut comes from off the carcass. "Cuts high in oleic acid (a healthy fatty acid) tend to correlate with improved flavor," Kerth says. "They also give the aroma that consumers like."

Oleic acid tends to be higher in cuts with marbling. Japan, Korea and China breed their cattle to have this high marbling content, formed when they can feed longer and their enzymes take steric acid and transform it into oleic acid.

Usually, American meat blends are formed with a selection of primal cuts such as brisket, shoulder rounds and chuck. "A happy medium of fat content today is 15 percent fat; 20 percent is the most flavorful blend to get," Kerth says.

A clear agreement and understanding of the expectations between the purchaser and consumer – and what is achievable by the processor – need to be laid out and discussed before blending.

"Blending typically tries to meet a target chemical lean content for the trim raw material that is to be ground," says Jonathan Campbell, Ph.D., a meat extension specialist, at Pennsylvania State University, based in University Park, Penn. "Blending is also a decision and balance between cost of raw materials and quality of the product, coupled with the daily volume of production and capabilities to meet the demand."

Once a target fat content for a blend has been agreed upon, having an acceptable and reasonable specification for fat content deviations from the target is necessary, Campbell says.

> **"WHEN CREATING OPTIMUM BLENDS (AND ANALYZING THEIR FAT CONTENT), THE MEAT SAMPLE – AND SOURCE – CAN CERTAINLY AFFECT RESULTS AND FLAVOR.**

EVALUATING FAT CONTENT

Most small processors do not conduct fat analysis on their product. Instead, they rely on the fat analysis given by their suppliers. But medium and large processors have more options available to them.

"Some rely on their supplier's data," says Jeff Sindelar, Ph.D., associate professor/extension meat specialist at the University of Wisconsin-Madison. "But most will analyze through different means to confirm the fat content coming in and for those products in their production process."

The most traditional (and precise) method is extraction, in which chemicals are used to extract fat measurements, says Sindelar.

"A more common method is NIR, or near-infrared analysis," says Sindelar. "NIR spectroscopic technology accurately reflects light in the sample to use logarithms to calculate fat."

NIR provides instant analysis but is pricey for small processors, Kerth says.

X-ray technology is also used for continuous, real-time analysis of fat content as one of the more common methods, but can be expensive at $10,000 to $20,000 for equipment.

Plain old cook loss is another method that only needs small instruments. A small sample is rapidly cooked, and the drippings are caught and analyzed. Or, a patty could be weighed before cooking then weighed afterward to determine the difference.

"The difference is most likely due to moisture loss, but the cook loss method can be used as a gauge to see if you are on the right track," Kerth says. "However, it's more art, less science."

"The method used depends on the processor's size and volume," Sindelar says. "Larger processors can confirm fat content in-house, while suppliers can provide a range of samples for smaller processors. It's important to make sure the quality and content are what you expect and are paying for."

To get rapid results, expect a fairly expensive process. Less expensive methods take time, Kerth says.

"Sometimes the trained eye is the best tool to recognize fat content – to use knowledge formed over time," Sindelar says.

TESTING THE RESULTS

Part of the challenge in blending and fat analysis is relying upon batch testing or bench-top results of a representative sample of the raw materials to be ground, blended and packaged.

"Processors are not making real-time decisions about each lot material to be used, but rather an educated guess to determine which raw materials to blend together to meet the lean and fat targets for a specific customer," Campbell says. "Certainly, rapid methods exist, but all are derived from and compare back to slower laboratory methodology that requires intricate labware and chemicals to achieve results, not to mention the expertise to perform the analysis and evaluate those results."

Because multiple methodologies exist, having another entity utilize a test method that is different from what was used to blend the finished product could also create discrepancies and variances in results.

"Rapid benchtop methods do not evaluate the entire lot of materials to be ground and blended, so technologies allowing for in-line confirmation of the entire lot or blended batch material as it moves through the process help to ensure less drift from the target fat content while achieving even more efficient and precise results," Campbell says of technologies such as NIR spectroscopy or Nuclear Magnetic Resonance (NMR) technology.

UNDER PRESSURE

POST-PACKAGING PASTEURIZATION OFFERS PROTECTION WITHOUT CHEMICALS.

BY MEGAN PELLEGRINI
CONTRIBUTING WRITER

The time between cooking and packaging is rife with potential for post-lethality contamination. Post-packaging pasteurization is a critical step in the food safety process to protect ready-to-eat (RTE) items during this time frame.

Hot water, steam, high-pressure processing (HPP), hot air, infrared heat, radiofrequency and irradiation are all different but useful methods for post-packaging pasteurization.

“For us, the rationale for HPP is very much skewed toward food safety intervention,” says Steven Burger, president of Burgers’ Smokehouse, in California, Mo. “The other benefits of HPP are that it allows us to take out chemical inhibitors and improve shelf-life extension.”

HPP is a non-chemical, non-thermal intervention method. “We use high pressure to kill pathogens, so we don’t negatively alter the product through the intervention,” Burger says.

Burgers’ Smokehouse also uses secondary inhibitors for extra protection when the package is opened by consumers or in an institutional environment. “So, the product gets initial protection from HPP and then a kicker on the back side,” Burger says.

In 2014, Burgers’ purchased its first HPP machine. “Due to the age of the machine and company growth, we are beginning discussions for another machine,” says Burger. “We use HPP two shifts a day, five days a week and one Saturday a month.”

Burgers’ has more than doubled the number of pounds it high-pressure processes over the last five years. The company uses HPP for cooked country ham, sugar-cured hams, all barbecue and smoked poultry — one-third of everything it produces. Two-thirds of Burgers’ products are uncooked or use the hot fill process, Burger says.

“With the advent of COVID-19 last year, our business-to-consumer side of the business grew tremendously,” Burger says. “So, when shipping through mail channels, it’s good to have extra food safety built into your product.”

Burgers’ was able to quickly pivot to the business-to-consumer channel last year, and sell to foodservice and retailers, because it could utilize HPP across all channels.

“I don’t see any hurdles with the existing technology,” says Burger. “The challenge is more through adopting a new technology or machine cost.”

> **AS RTE PRODUCTS CONTINUE TO INCREASE IN POPULARITY, POST-PACKAGING PASTEURIZATION SYSTEMS WILL BE AN ESSENTIAL COMPONENT OF FOOD SAFETY INTERVENTIONS.**

FOCUSED ON FOOD SAFETY

West Liberty Foods is another company that has continually looked for avenues of differentiation and has focused on food safety as a guiding principle. “HPP also helps us protect the company’s and our customer partners’ brands,” says Joe Swanson, vice president of operations at the West Liberty, Iowa, company. “It enhances the shelf life of our products without the use of chemical preservatives and it is environmentally friendly, using only recycled water and electricity.”

West Liberty Foods processes uncured sliced deli meats, individual quick-freezing chicken items that are sold fresh versus frozen, items with clean labels and raw fresh ground turkey.

“The main advantages HPP has provided West Liberty Foods is the ability to have clean-label products that maintain the same physical attributes of color and flavor of non HPP-ed products,” Swanson says. “Currently approximately 20 percent of our business uses HPP post packaging pasteurization.”

The primary challenge West Liberty Foods has experienced with HPP is the added cost compared with other methods. “This has limited the products that can process using the method while remaining cost competitive,” Swanson says.

As RTE products continue to increase in popularity, post-packaging pasteurization systems will be an essential component of food safety interventions.

“I think the industry will see improvements in the efficiency of the (HPP) process and a reduction in the cost of consumable machine parts, which will help make the process more cost competitive,” Swanson says.

BARRIER FILM TECHNOLOGY HAS HAD QUITE A RUN

BY CHIP BOLTON

Without dwelling much on the past, it progressed from shrink bags to case-ready and vacuum skin to flex/flex and other formats all the while delivering extended freshness life for an expanding lineup of protein applications. Today it continues that winning streak.

At first there was just a handful of barrier film suppliers because groundbreaking innovation requires financial resources and considerable skill. After the pioneers validated the concept and created a preliminary portfolio of barrier options the inevitable happened. Less costly knockoffs began filtering into the marketplace. With the hard work done, hurdles to market entry weren't so daunting. As an executive remarked about today's barrier technology, "It's ubiquitous, right? It's everywhere, so by default if it's everywhere it's commoditized."

I can't comment on commodity status, and it's not my point. But undeniably there are tons of barrier film options and formats for protein brand owners to choose from. If you have an application, the film suppliers have got you covered. So, what's driving market relevance?

Surprisingly, it's not sexy, whiz-bang science, but basic blocking and tackling, according to one veteran source. "Processors value reliability, meaning how a film runs, and that it provides the needed shelf life consistently. They want it to come in and run on their machines, without adjustments, at a fair price." He goes on to say that they want a buffer in their shelf life in case of unforeseen delays in the supply chain. "If they're putting 28 days on a pack, they'd love 35."

Interestingly, in some cases the extra shelf life can be more significant than just widening the distribution and retail sales windows, giving those who can deliver consistently a leg up. The source recounted a circumstance where a processor went from 28 days to 40 days of distribution life after testing a new film. "They decided to keep the 28 days on the pack because at the end of that time their product looked better and tasted better in the stronger barrier format. It made for a better customer experience." For shoppers, there may even have been some visible difference between the product and competitors alongside in the display case as they approached the sell-by dates.

"FOR PROTEIN PACKAGING AND THE PACKAGING SEGMENT IN GENERAL, ENVIRONMENTAL STEWARDSHIP IS, ARGUABLY, A TOP CONCERN FOR EVERY LINK IN THE INDUSTRY'S SUPPLY CHAIN.

This doesn't mean that focusing on basic deliverables is the sole route to differentiation. Film makers are still willing to invest in innovation. "Everyone's searching for new markets, and they may require different performance specs and might need some tailoring or tweaking. They're also looking to improve yields, and I guess thirdly would be a recyclable option."

For protein packaging and the packaging segment in general, environmental stewardship is, arguably, a top concern for every link in the industry's supply chain. "The sustainable genie is out of the bottle," exclaims the executive. "Having a barrier material which would provide sufficient shelf life, moisture resistance, oxygen transmission rate and has a recyclable footprint or opportunity to it is something that would be of keen interest."

If necessity truly is the mother of invention, the great need or perhaps new frontier of barrier film technology seems clear. This isn't news to anyone. Most likely the science, while requiring effort and skill, is doable. Making the subsequent economics acceptable to all the stakeholders may be the more difficult task. But that's a discussion for another day.

THROUGH THE POULTRY SUPPLY CHAIN

RYAN BENNETT
Executive Director
U.S. Roundtable for Sustainable Poultry & Eggs

AUGUST 24, 2021 @ 2 PM EDT

The poultry industry has been hard at work developing ways to conserve resources and preserve the environment at every stage, from farm to table. Industry experts will speak about some of the latest sustainability initiatives taking place within the industry.

aptean

MULTIVAC
BETTER PACKAGING

Linde
Making our world more productive

THE NATIONAL PROVISIONER

WWW.PROVISIONERONLINE.COM/WEBINARS

BEEF PLANT *OF THE FUTURE*

SMALLER OPERATIONS, IMPROVED TECHNOLOGY, MORE AUTOMATION EXPECTED

BY H. RUSSELL CROSS, PH.D., AND DAVEY GRIFFIN, PH.D.
TEXAS A&M UNIVERSITY COLLEGE OF AGRICULTURE AND LIFE SCIENCES

The introduction of COVID-19 caused unexpected changes for the world and will continue to have an impact on the agriculture industry for years to come. One of the industry segments directly hit by this change will be the beef packing segment.

Many of the changes began well before COVID but were accelerated as a response to pandemic-induced circumstances. In reality, a crystal ball might be necessary to reveal exactly how the beef harvesting and processing plants of the future will look. Five years ago, industry leaders might have asked how beef processing would change in 10 to 20 years. But now, given how extensively the tides of change have affected the meat packing industry, today's agricultural leaders should be asking what beef plants might look like in as little as five years.

The United States has fewer than 30 large plants that harvest more than 85% of our fed beef. These plants are old, have large hourly work forces and fight a continuous battle to upgrade and incorporate modern technologies within existing space/configuration limitations.

What to consider for the next phase of beef plants

Several questions need to be considered for what's to come. What changes should the beef packing industry expect in the next five years? How many cattle will the new plants harvest each day? What type of workforce will be utilized? How will robotics and other technologies be utilized?

After polling several industry leaders and experts, the following are some beef processing expectations:

- New beef plants will be smaller and will harvest fewer than 2,000 head per day.
- Cattle will be sourced from the ranch, stocker and feeder and will be selected to be more consistent in weight, frame and type to meet specific branded product needs.
- Cattle handling pens will continue to be designed with animal welfare as a priority.
- Block chain technology will be enabled to allow transparency and traceability of product moving from the ranch to the finished package.
- The design of the plant of the future will likely begin by looking at the technology currently being used by the pork industry. First steps could be to modify or automate existing technology for beef carcass splitting, evisceration and foot and head removal.
- The plant of the future will likely begin the slaughter process with chemical dehairing on the harvest floor, a major intervention to control bacterial growth on the carcass. Dehairing will produce a clean carcass that has been commercially sterilized on the surface. Little to no surface trimming will be necessary, thus increasing yield and decreasing the need for trimmers.
- Cattle will be handled on the harvest floor in a different manner. The packing industry will utilize automated hot fat trimming of surface fat, allowing for decreased labor in the fabrication room and more uniform chill. The packing process will also include partial hot boning of parts of the carcass. These hot-boned products will go straight into value-added products without chilling. Product yields will be significantly increased.
- Robotics will have expanded roles throughout the plant. Many feel that robotics will see expansion in the fabrication and value-added areas, but robotic technologies could also be effectively utilized on the harvest floor. Hourly jobs will decrease or change significantly, but IT-type jobs will increase. Processing steps require intensive worker involvement. Ideally, technology will assist in those processes and make those jobs safer and less strenuous, resulting in better precision, less worker fatigue and less variable products.
- Worker safety will be improved by using robotics in the more difficult or dangerous jobs.
- Artificial intelligence and machine learning will be used in every step, from the ranch to the finished package.
- The plant of the future will be digitized. All data will be captured digitally so that real-time monitoring of worker safety, food safety, etc. will be possible. Issues will be tracked and addressed before the product leaves the plant. All paper will be removed from the food processing floors.
- The plant of the future will have different layouts in deboning areas to accommodate the use of new robotic systems.
- Trim will be handled more efficiently, resulting in better lean-point management.
- The plant of the future will have the ability to capture better yield data due to the in-line carcass identification coupled with robotics that necessitates in-line processing. True carcass yields will drive improvement.
- The plant of the future will have streamlined and automated packaging systems resulting in reduced labor and packaging costs.
- Vision technology coupled with artificial intelligence, bio-metrics and machine learning will create strong management operating systems that allow for real-time feedback on things such as employee safety, food safety, sanitizing procedures, labor efficiency, adherence to job procedures, social distancing and yield management.
- Use of camera systems will be expanded throughout the plant to measure animal handling, product workmanship and worker safety.
- The plant of the future will be more focused on supply chain and consumer claims, which better link the producer to the consumer.
- With chemical dehairing and the removal of dirt, hair and their associated pathogens, the slaughter process will produce a more even hide split and a higher yield of raw materials for pet treats.
- Airflow in the plant will be clean to dirty.
- Improved water-use systems will decrease overall use and increase water reuse.
- The newer plants will generate much of their own energy needs from biodigesters.
- The plant of the future will be a total food plant that produces not only boxed beef, but value-added products such as retail case-ready products, sous vide cooked products, snack foods and pet treats.
- All of these new technologies will drive new challenges to recruit and train highly skilled labor to rural locations.

These changes may be accomplished in five years or less. In 10 to 20 years, the harvesting segment of the beef industry will likely be taking even greater leaps than those suggested, through incorporation of technologies not yet on the market. It is possible that the plants of the future will have the capability to harvest and fabricate 2,000 animals per day with 80% fewer hourly workers, changing the face the harvesting industry.

H. Russell Cross, Ph.D., is a professor of meat science and Davey Griffin, Ph.D., is a professor and Texas A&M AgriLife Extension Service specialist, both in the College of Agriculture and Life Sciences Department of Animal Science at Texas A&M University. Cross was the former department head and holder of the E.M. "Manny" Rosenthal Chair in Meat Science. Griffin serves as a liaison between industry, commodity groups, medical and dietary professionals and AgriLife Extension personnel to provide research information and technology. His key program areas include cutability and composition of carcasses associated with value-based marketing, current consumer issues concerning meat and meat products, youth development and cooperative research projects.

Solutions *for* **TODAY,** Planning *for* **TOMORROW**

FOOD SAFETY SUMMIT CONFERENCE & EXPO®

Produced by FoodSafety magazine

SAVE THE DATE

JOIN US MAY 9–12, 2022 AS THE FOOD SAFETY SUMMIT RETURNS IN PERSON TO ROSEMONT, IL!

May 9–12, 2022 | Donald E. Stephens Convention Center | Rosemont, IL

After two consecutive virtual conferences, food safety professionals will gather in person at the **Food Safety Summit** to connect, collaborate, and improve systems designed to keep the food supply safe. Plan to join us at the Donald E. Stephens Convention Center in Rosemont, IL on **May 9–12, 2022** to learn highly relevant insights from top subject matter experts, evaluate new technologies from blue chip vendors, and discover cutting-edge food safety solutions!

Did You Miss the Virtual Event in 2021?

Don't worry! All sessions remain available online until **April 2022,** so you can go back and review them at your leisure. Thanks to our valued sponsors, the following on-demand content is available for **FREE:**

- Keynote presentation
- Town Hall with regulatory officials
- Beyond COVID general session
- ALL Solutions Stage presentations
- ALL Tech Tent presentations

Learn More at : www.**FoodSafetySummit**.com

MEDIA PARTNERS

Food Quality & Safety · Food Safety News · QA · Dairy Foods · Food Engineering · The National Provisioner · Prepared Foods · SFWB

HIGH DEMANDS ON CHICKEN PROCESSORS

BY ELIZABETH FUHRMAN
CONTRIBUTING WRITER

Currently, one of the greatest challenges for chicken processors is keeping up with demand. According to the U.S. Department of Agriculture, broiler head produced was down 4 percent in the first quarter of 2021, and pounds produced declined 3 percent.

“Production began picking back up in the beginning of April, and there should be about a 3.3 percent increase in Q2 vs. a year ago,” says Tom Super, Washington, D.C.-based National Chicken Council’s senior vice president of communications. “Supply is somewhat tight, but the sky certainly isn’t falling, and production seems to be ramping back up as we head into summer.”

With restaurants opening back up as restrictions begin to lift, chicken processors also have adjusted their product lines and supply chains to get back to a more normal retail vs. foodservice mix. In turn, the two most in-demand cuts are boneless/skinless breast and wings. “’Chicken sandwich wars’ have led to an increase in demand for breast meat, and growing wing demand has proven to be pandemic proof,” Super says.

“If you think about it, restaurants like wing joints and pizza places were built around takeout and delivery, so they didn’t have to change their business model that much during the pandemic,” he explains. “Wings travel well and hold up during delivery conditions. Plus, they aligned with consumer desire for comfort food during the pandemic.”

With chicken wing demand high, producers also have a very tight supply of the cut. Chicken producers currently are working to overcome the devastating impact of the winter storm on Texas and nearby states – major chicken producing regions. That weather event also took place in February, right after the biggest event of the year for wings: the Super Bowl.

“CHICKEN PRODUCERS CURRENTLY ARE WORKING TO OVERCOME THE DEVASTATING IMPACT OF THE WINTER STORM ON TEXAS AND NEARBY STATES – MAJOR CHICKEN PRODUCING REGIONS.

“It will take time and effort to eventually replace the impacted hatchery supply flocks in that region, but supply should catch back up to demand soon,” Super explains. “So as high as demand is for wings right now, even small gaps in the supply of wings can cause big fluctuations in price.”

Additionally, some fertility problems with roosters have been reported in the past several months that has led to some minor production issues that are making their way through the pipeline.

The industry produces tens of billions of wings annually, and producers are working diligently to meet the upsurge in consumer demand by adding millions more. As chicken production begins to resume back to a more normal output in the coming months and a better supply/demand ratio develops, the market tightness should ease, Super says.

Additionally, each chicken only has two wings, and producers don’t raise chickens just for the wings. “They have to sell all of the other parts as well,” Super adds.

Feed prices also are always top of mind for chicken processors, and 2021 is no different. “Corn and soybeans look good enough at this time, but it’s a long time before the harvest is in the bins,” Super says.

Coupled with the challenges of meeting production demands, like most U.S. industries, chicken processors currently are grappling with a tight labor supply.

“Labor challenges are nothing new to our industry,” Super says. “Processors have been adapting to meet those challenges for years. Processing plants have been embracing more automation, offering even more competitive wage rates and attractive benefit packages, creatively managing shifts, offering flexible work schedules, and hosting job fairs, all in an effort to attract more workers.”

Additionally, chicken processors have been diligently working to keep employees safe and healthy during the pandemic through in-plant mitigation efforts. “Getting employees vaccinated has been the latest effort undertaken by the industry,” Super says.

FOR MORE INFORMATION, ABOUT CHICKEN PROCESSING, VIST THE FOLLOWING SUPPLIERS:

Baader
Bettcher Industries
Biro Mfg. Co.
Foodmate US
JBT FoodTech
Marel Inc.
Meyn America LLC
Middleby Processing and Packaging
Provisur Technologies

INTERCEPTOR METAL DETECTORS SAVE PORK PRODUCER'S BACON

Four Interceptor metal detectors from Fortress Technology has enabled a North American pork producer to meet its new fast-food customer's tough requirements for accurately and reliably inspecting high volumes of bacon. Thanks to the Interceptor's increased sensitivity and simultaneous multi-frequency innovation, the producer has not only satisfied its client's stringent food safety specifications, it has also eliminated false rejects by isolating product effect.

When a leading pork producer won a new contract with a major fast-food chain, investment in a higher-quality metal detection system was crucial to meeting its client's exacting standards. The company's existing inspection equipment was struggling to cope with the notorious product effect common with challenging meat products that are wet and highly conductive.

Salty products such as bacon can be especially challenging to inspect. Salt increases the conductivity of the wet product, which impacts a metal detector's ability to distinguish between any metal contaminants, including stainless steel, that may have been introduced during processing and the false signal given by the combination of product attributes. These different factors can lead to false readings and consequently higher product waste.

Regional Sales Manager at Fortress Technology Eric Garr relays, "Product effect can make it difficult for standard detectors to tell the difference between the signal generated by the bacon itself and any signal given off by a metal contaminant. As well as resulting in a high volume of false rejects, there's greater potential for real contamination to be missed."

SALTY PRODUCTS SUCH AS BACON CAN BE ESPECIALLY CHALLENGING TO INSPECT. SALT INCREASES THE CONDUCTIVITY OF THE WET PRODUCT, WHICH IMPACTS A METAL DETECTOR'S ABILITY TO DISTINGUISH BETWEEN ANY METAL CONTAMINANTS, INCLUDING STAINLESS STEEL, THAT MAY HAVE BEEN INTRODUCED DURING PROCESSING AND THE FALSE SIGNAL GIVEN BY THE COMBINATION OF PRODUCT ATTRIBUTES.

SIZE SENSITIVE IN ONE PASS

With the fast-food chain demanding more stringent sensitivity specifications, the bacon producer sought a solution to conquer product effect once and for all. User friendly features that support quick set up are always highly valued by this busy production plant, notes Garr.

Inspecting retail and bulk packages of bacon ranging from between 10 lbs. and 15 lbs., single pass product learning and automatic calibration means that operatives are not having to constantly reset and recalibrate the metal detector for the different pack sizes. "These automated technology features make the manufacturing process much simpler for production staff and significantly reduces the time spent introducing and checking operating protocols," adds Garr.

The Interceptor works by carrying out a real-time analysis of a low-frequency and a high-frequency output signal simultaneously. Although the size of metallic contaminant that's detectable depends on the product size and temperature, as well as the aperture size, typically the Interceptor can improve detection levels for stainless steel by as much as 100 percent in contrast to standard metal detectors. The result is a more reliable and accurate reading regardless of size, shape and orientation of metal particles.

Additionally, a built-in Noise Immunity structure minimizes external electrical disturbances, further lowering the occurrence of false rejects.

The enhanced sensitivity, accuracy and cost efficiencies have more than satisfied the producer's new clients' exacting demands. Having invested in four new Interceptor, the pork plant continues to retain its solid reputation for quality and food safety.

"With the Interceptor, Fortress continues to safeguard some of the leading products and brands by challenging traditional detection expectations and ensuring product effect does not compromise inspection performance or operational efficiencies," says Garr. "The combination of 100% increased metal detection sensitivity, elimination of false product rejects and easy to use automated features has reassured our client, their customer and consequently millions of fast food consumers. Everyone is happy!"

The United States of Pork

As pandemic-weary consumers begin to travel and look for new recipes during a summer that's starting to feel more "normal," The National Pork Board is encouraging Americans to let their taste buds explore the most popular pork dishes in every state. The Pork Board, and the 60,000 U.S. pig farmers it represents, has released the results of a new consumer survey showing the top pork dishes in each state. These favorites highlight the unique, diverse and delicious pork flavors loved by people across the country.

Some of the pork facts:

PORK'S STRONG CONNECTION TO REGIONAL HISTORY

- The pork pasties of South Dakota or West Virginia's pepperoni rolls are directly tied to filling hand-held meals for miners. Pork helped shape the early economies of many U.S. states.

ETHNIC INFLUENCES ABOUND

- Many dishes are influenced by the European traditions brought by early immigrants, as German sausages, pizza, and a variety of Italian sandwiches demonstrate. But the growing influence of Latino and Asian cultures cannot be overlooked, especially as the study dives deeper into the second and third most popular dishes in each state.

EVERYONE AGREES (AND DISAGREES) ON BARBECUE. AND PIZZA.

- The distinct regional preferences in barbecue styles show how while we all may disagree on how to prepare it, there's no disagreement that pork is preferred protein to go low and slow with. And while Illinois agrees that Chicago-style deep dish pepperoni pizza is the lake-front favorite, there will be an eternal debate on which Windy City establishment crafts the best pie.

SAUSAGE IS KING

- It's loved everywhere. From pepperoni, bratwurst, hot dogs, corn dogs, reindeer sausage (yes, it's made with pork), to biscuits and sausage gravy, the savory, indulgent flavors that pork-based sausages provide are favorites from coast to coast.

Each state's top pork dish is featured on pork.org/porknation, where recipes and inspiration are easily found.

CLASSIFIED ADS

CLICK BOXES BELOW TO LEARN MORE

EQUIPMENT FOR SALE

MEAT PROCESSING EQUIPMENT FOR SALE

FOOD SAFETY

EDITORIAL

Chris Luke | Group Publisher
lukec@bnpmedia.com | (908) 917-4171

Andy Hanacek | Editor-in-Chief
hanaceka@bnpmedia.com | (847) 405-4011

Sam Gazdziak | Managing Editor
gazdziaks@bnpmedia.com | (770) 330-8184

Cory Emery | Art Director emeryc@bnpmedia.com

Jennifer Allen | Advertising/Production Manager
allenj@bnpmedia.com | (248) 833-7347

CORPORATE

Darrell Dal Pozzo | Chief Experience Officer

Rita M. Foumia | Human Resources & Information Technology Director

Vincent M. Miconi | Production Director

Lisa L. Paulus | Finance Director

Michael T. Powell | Creative Director

Beth A. Surowiec | Clear Seas Research Director

Scott Wolters | Chief Event Officer

SALES

Chris Ward | Account Manager
AL, CT, DE, FL, GA, KS, MD, ME, NC, NJ,
NY, PA, RI, SC, VA, VT, Puerto Rico
cbwmedia.llc@bnpmedia.com | (678) 361-7815

Wayne Wiggins | Account Manager
AK, AZ, AR, CA, CO, HI, ID, IL, IN, IA, KS, MI,
MN, MO, MT, NE, NV, NM, ND, OH, OK, OR, SD,
UT, WA, WI, WY
wwiggins@wigginscompany.com | (415) 377-6130

Laurel Metz | Account Manager | MA, NH, Ontario
metzl@bnpmedia.com | (248) 833-7300

Pam Mazurk | Account Manager
International outside of Mexico and Latin America
mazurkp@bnpmedia.com
001-847-247-0018 (O) | 001-847-226-6729 (M)

Becky Mcclelland | Classified Sales
mcclellandb@bnpmedia.com | (248) 833-7385

EVENT & WEB MARKETING

Nikki Smith | Online Development Director

Erin Mygal | Directory Development Director

THE NATIONAL PROVISIONER (ISSN: Digital 1938-3835) is published 12 times annually, monthly, by BNP Media II, L.L.C., 2401 W. Big Beaver Rd., Suite 700, Troy, MI 48084-3333. Telephone: (248) 362-3700, Fax: (248) 362-0317.
 Change of address: Send old address label along with new address to THE NATIONAL PROVISIONER, P.O. Box 2145, Skokie, IL 60076. Email: nationalprovisioner@omeda.com For subscription information or service, please contact Customer Service at: Phone: (800) 952-6643 Fax: (847) 763-9538.

CONTACT US

PH: (248) 362-3700 | MAIL: 2401 W. BIG BEAVER RD, TROY MI 48084

ARE YOU SENDING YOUR CUSTOMERS CONTENT THEY VALUE?

We Create Great Content to Drive Your Marketing

Your brand has a personality and a story to tell.
Our agency guides your content marketing efforts by creating a unique plan that tells your story.

bnp ENGAGE

Our Services

Interactive Digital Marketing

Co-branded eBooks

Content Creation

Custom Publishing & Advertising

Visit www.BNPEngage.com for more information.

AD INDEX

AMERICAN MEAT SCIENCE ASSOCIATION
WWW.MEATSCIENCE.ORG/RMC
CLICK HERE TO SEE AD

HANDTMAN
HANDTMANN.LINK/SAUSAGEREPORT
CLICK HERE TO SEE AD

HEAT & CONTROL
WWW.HEATANDCONTROL.COM
CLICK HERE TO SEE AD

JARVIS PRODUCTS
WWW.JARVISPRODUCTS.COM
CLICK HERE TO SEE AD 1
CLICK HERE TO SEE AD 2
CLICK HERE TO SEE AD 3

LUBRIPLATE
WWW.LUBRIPLATE.COM
CLICK HERE TO SEE AD

OSSID
WWW.OSSID.COM
CLICK HERE TO SEE AD

POLYCO USA
POLYCO USA
CLICK HERE TO SEE AD

PROSUR
WWW.PROSURINC.COM
CLICK HERE TO SEE AD

QMS INT'L
WWW.QMSINTL.COM
CLICK HERE TO SEE AD

REEPACK
WWW.OSSID.COM
CLICK HERE TO SEE AD

TIPPER TIE
WWW.TIPPERTIE.COM
CLICK HERE TO SEE AD

UNITECH WASHERS
WWW.UNITECHWASHERS.US.COM
CLICK HERE TO SEE AD

WEST LIBERTY FOODS
WWW.WLFOODS.COM
CLICK HERE TO SEE AD

SOURCEBOOK PREMIUM SPONSORSHIPS

Below are premium listings from our Sourcebook. For the complete list of companies and products, go to:
www.provisioneronline.com/sourcebook

eagle
QUALITY. ASSURED.

HAWKINS
Food Ingredients Group

hovus
...inventive packaging solutions

ISI
INGREDIENTS SOLUTIONS, INC.
SPECIALTY HYDROCOLLOIDS