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OCTOBER 2024 / VOLUME 236 / ISSUE 11



COVER STORY

STATE OF THE INDUSTRY 2024 – While consumers increasingly seek new products that deliver value, the meat and poultry industry must balance opportunities with challenges.

STATE OF THE INDUSTRY TOPICS

BEEF PACKAGING
CHICKEN SUSTAINABILITY
PORK ANIMAL AGRICULTURE
TURKEY ANIMAL WELFARE
FOOD SAFETY PLANT-BASED PROTEINS

▶ FEATURED CONTENT

FIGHT FOR FOOD SAFETY

The surge in USDA Public Health Alerts: A new focus in food safety.

PACK EXPO 2024 PREVIEW

Featuring 2,600 exhibitors and more than 150 free educational sessions, this year's Pack Expo International will unite more than 45,000 packaging and processing professionals from across over 40 vertical markets.

DEPARTMENTS

PROCESSOR



STATE OF THE INDUSTRY: LAMB Promotional efforts play up lamb's value cuts as well as premium cuts.



STATE OF THE INDUSTRY: VEAL Consumption decrease underscores growth opportunities.



STATE OF THE
INDUSTRY:
SEAFOOD
Messaging focusing
on seafood's
nutrition,
sustainability and
cooking tips
resonates with
consumers.



COMMENTARY: SOUTHWEST MEAT ASSOCIATION With an aging workforce and increased competition for workers, businesses often struggle to meet staffing needs.



COMMENTARY: AMSA Butter and lard as coating materials in beef aging.



NEXT >>>

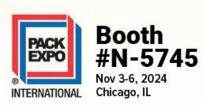




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TOP-VIEWED NEW CONSUMER PRODUCTS:

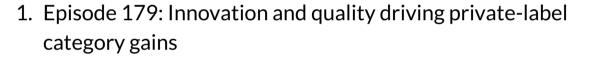
- 1. The Habit Burger Grill brings back French Onion Char for fifth time
- 2. Freddy's launches new Prime Steakburger for a limited time
- 3. Culver's launches first celebrity meal with JJ Watt
- 4. Dickey's Barbecue brings Rancher's Premium sausages to Walmart
- 5. Prairie Fresh pork launches first LTO



MOST-POPULAR FEATURES:

- 1. News and new products from the 2024 AAMP Convention expo floor
- 2. Meat Industry Hall of Fame inducts Class of 2023
- 3. Women's Meat Industry Network executive director receives WIA Demeter Award
- 4. 2024 Processor of the Year: Seaboard Foods
- 5. 2023 Top 100 Meat and Poultry Processors

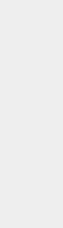


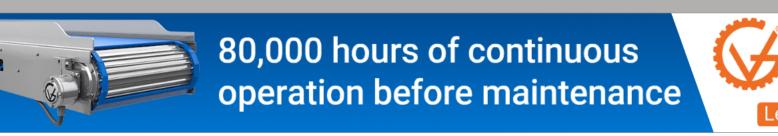


- 2. Episode 178: Greasezilla offers processors an innovative way to deal with fats, oils and grease
- 3. Episode 177: Dr. David Buckley discusses strategies to minimize avian influenza threat
- 4. Episode 176: SMA rebrands to better serve its growing associate base
- 5. Episode 175: 84.51° Insights Director breaks down meat consumer trends









K BACK





As we enter the final quarter of 2024, consumers may not be optimistic, and they're definitely being cautious when it comes to food spending.

According to the August 2024 Consumer Sentiment Index from the University of Michigan, American consumer weigh in at 67.9 points, far below the neutral sentiment index reading of 100. Consumers cite high prices and a perception substantial economic uncertainty for their less-thanrosy outlook.

These consumer concerns translate into fewer restaurant visits and a greater share of food spending at retail in recent months. Despite this price-consciousness, consumers also are focused on other considerations – such as time-savings and convenience — when making their purchase decisions, driving value-added and deli-prepared food sales.

For our October 2024 edition, we've collected input from stakeholders in more than a dozen key industry sectors for our State of the Industry 2024 Special Report. Take a look, and learn how different sectors of the meat, poultry and seafood products value chain is positioning itself to meet the changing needs of consumers.



FRED WILKINSON



EMAIL FRED WILKINSON











Join us for an exclusive look into the future of the protein industry with The National Provisioner's 2024 State of the Industry webinar, a key feature of our October eMagazine. Dive deep into transformative insights as consumer research experts from Circana take the stage. Don't miss the chance to hear from Chris DuBois, Circana's Executive Vice President and Perimeter Practice Leader, alongside the insightful Madalene Nelson. Together, they'll explore the dynamic areas of the protein category that are experiencing explosive growth. Secure your spot now—this is a session you won't want to miss!

LEARNING OBJECTIVES:

K BACK

- Learn how consumer spending is influencing new product development
- Get up to date on challenges and opportunities for meat and poultry products
- Understand consumer food spending trends to position your business to grow in 2025







CHRIS DUBOIS Executive Vice President, Perimeter Practice Leader Circana



MADALENE NELSON Senior Director, Client Sales & Insights Circana

NOVEMBER 19, 2024 AT 2:00 PM EST

PROVISIONER







WHILE CONSUMERS INCREASINGLY SEEK NEW PRODUCTS THAT DELIVER VALUE, THE MEAT AND POULTRY INDUSTRY MUST BALANCE OPPORTUNITIES WITH CHALLENGES, INCLUDING THE TIGHT BEEF SUPPLY AND AVIAN INFLUENZA.

BY DAN EMERY

Just like every year, the meat industry faces a series of challenges. Knowing the professionals in this business we will overcome these obstacles to continue to service our consumer base with superior quality products. Consumers are challenged because of the reduction in buying power.

Due to drought conditions of 2022, cattle farmers dramatically reduced their beef herd to a level not seen since 1951. With Proposition 12 and similar bills going into effect in other states we are feeling the constraints of animal welfare and animal confinement rules that make it more difficult to have universal practices throughout the 50 states. With HPAI impacting poultry, livestock and humans, this situation continues to evolve. The restaurant industry has rebounded and accounts for more than 50% of food dollars spent.

Consumers are increasingly concerned about health and well-being, focusing on healthier ingredients and options. The fear of climate change is bringing sustainability to the top as one of the many issues consumers are focused on. Along with dramatic global inflation, demand for value products has increased dramatically. With the difficulties consumers are experiencing, it's reasonable to see a possible change in administrations, which may affect our regulatory environment. We will explore this and many other trends in our business that will challenge us in 2024 and 2025.

OUTLOOK FOR THE ONGOING TIGHT BEEF SUPPLY SITUATION

The 2025 outlook for beef production is forecast at 25.12 billion pounds, according to the USDA's Economic Research Service. Next year will mark the third consecutive year of lower production. It will be the lowest since 2015 when the sector began to rebuild after the 2009-13 drought. Beef processors in the US face the likelihood of continued sizable losses in the second half of 2024. Springdale, Ark.-based Tyson Foods Inc., the largest processor of fed beef, projects a \$100 million to \$400 million operating loss in its beef segment in fiscal 2024, which ends Sept. 30, 2024. It reported a \$241 million loss in its first six months. Such losses will continue into 2025, as USDA forecasts beef production next year will be down 5.5% for 2024 and that live cattle prices will increase by 2.4%. They are set to average \$183.50 per cwt this year, versus \$175.54 per cwt last year. These changes reflect tighter cattle and beef supplies as the cattle herd continues to contract.

Pressure on beef packers will be heightened by the fact that there are still no signs of heifer retention or beef cow herd rebuilding. This suggests that overall cattle numbers on Jan. 1 next year will be lower than on Jan. 1 this year, when the total was 87.2 million head. This was the lowest total since 1951. Companies building new processing plants question if there are sufficient cattle supplies to run their new plants economically. The relatively strong pace of beef cow slaughter, along with relatively large placements of heifers in feedlots in 2023 and in 2024, may yield a smaller year-over-year calf crop in 2025, tightening future cattle supplies, ERS said. Total beef disappearance in 2025, measured on a per-capita retail weight basis, is expected to decline 5% from 58.1 pounds this year to 55.6 pounds. As production declines next year on the largest decline in cattle slaughter since 2013-2014, it will be partially offset by record beef imports and eight-year-low exports, ERS said. Frozen beef was 407,127 in July, down about 0.2% from June and 1% lower than a year ago.

CHICKEN PRODUCTION INCREASE

Broiler production next year is expected to increase by 1.6% from this year's forecast of 46.9 billion pounds to 47.6 billion pounds. The modest expected increase in broiler production is based on firm demand and favorable feed prices, said ERS. Producers are already reporting improved earnings reflecting the change in supply and demand. Total frozen poultry in freezers was 1.22 billion pounds, up 2% from June but 5% lower than July 2023. Chicken in freezers rose 2% in July to 757 million pounds, led by double-digit expansion of stocks of legs, leg quarters and hens/mature chickens. Compared to July 2023, total chicken in cold storage was down 10%. The Russian embargo continues to be an issue with leg meat markets.

PORK OUTPUT UPTICK

Pork production next year is forecast to increase by 1.2% to 28.4 billion pounds from 28.1 billion pounds this year. The higher pork production forecast derives from growth in pigs per litter that will more than offset fewer expected farrowing's, ERS said. Supplies of frozen pork declined 5% in July, according to monthly cold storage data from the USDA's National Agricultural Statistics Service (NASS). Pork in freezers on July 31 totaled 450.7 million pounds, 4% lower than the same date a year earlier. The July pork belly supply of 42.7 million pounds represented a drop of 30% from June and 17% from a year ago.

TURKEY PRODUCTION DROPPING

Turkey production is expected to drop in 2024 and 2025 Turkey production in June 2024 totaled 408.8 million pounds, a decrease of 17.2% from June 2023. Impacted by the loss of 545,600 birds to Highly Pathogenic Avian Influenza (HPAI) in Minnesota and Iowa. Based on a second month of very low levels of turkey eggs in incubators, projected fourth-quarter production was adjusted down, 2024 production is projected at 5,115 million pounds, a decrease of 6.3% from 2023. Projected turkey production in 2025 was also adjusted down, reflecting these recent trends. Frozen turkey rose 3% month-on-month to 460 million pounds, a jump of 5% year-on-year.

THE IMPACT OF PROP 12

K BACK

In a May 2024 ruling, the US Supreme Court upheld the California law (Proposition 12) banning sales of pork products from producers that do not comply with livestock housing requirements set by California voters in a 2018 ballot initiative.

The Supreme Court ruling means Prop 12 (and Question 3 in Massachusetts) are finally going into effect. It will be challenging for producers to increase the space required for animals and go through the certification process. It will mean increased costs for producers in a market that's economically challenged, limiting the ability to increase prices. This may also force some producers to abandon their production in certain states. Smithfield's closure, and Cargill sale of their California facility may be related to perceived difficulties being profitable under Prop 12. Other states like Massachusetts have enacted similar laws, but they will have

a much less significant effect than California. Meat and poultry consumers are seeking value

According to the "US Grocery Shopper Trends 2024: Finding Value" report from FMI -- The Food Industry Association, consumers

- have changed their approach to grocery shopping based on their needs: • 83% of consumers report they have moderated grocery spending
 - 79% of shoppers say their top con cern is finding a good value
 - 63% of shoppers continue to look for deals by adjusting the stores they visit and products they purchase.

"While we understand shoppers' concerns about the price of food on store shelves, our US Grocery Shopper Sentiment Index shows consumers appreciate the ability to find value in their grocery shopping and continue to enjoy grocery shopping, a trend we expect to continue as food inflation cools," said FMI President and CEO Leslie G. Sarasin. More than four in 10 shoppers with household incomes under \$75,000 report they buy fewer food items and more private-label brands. Consumers are augmenting their grocery shopping habits as they work to control their spending levels heading into the fall, according FMI research.

"Shoppers report that one of the few parts of their household budgets they can control is their grocery spending and that through taking advantage of deals, promotions or shopping around, they continue to find value," said Leslie G. Sarasin, president and CEO of FMI.

FMI also pointed to USDA data that found inflation for most food categories fell below historical averages in the first half of 2024.

The USDA also projects food-at-home prices will increase by only 1% this year, while next year's forecast dips below this benchmark

significantly to a 0.7% anticipated increase for 2025. "With shoppers including meat in nearly 87% of home-cooked meals every week, they are looking to meat to make occasions special, the opportunities to provide great choice, taste, and value continue to grow," said Rick Stein, vice president of fresh meat for



HPAI THREATS TO THE PROTEIN INDUSTRY

Thirteen human cases of H5N1 virus infection have been reported in the US since April 2024, according to an Aug. 16, 2024, update from the Centers for Disease Control and Prevention. Four of these cases were associated with exposure to sick dairy cows, and nine were associated with exposure to H5N1 virus-infected poultry.

USDA reported that 191 dairy cow herds in 13 U.S. states have confirmed cases of H5N1, and this number continues to grow. Since April 2024, there have been H5N1 detections in 35 commercial flocks and 21 backyard flocks, for a total of 18.68 million birds affected H5N1 cases in dairy herds and poultry flocks continues to grow, according to USDA. The CDC's assessment is that the immediate risk to the public from H5N1 remains low. CDC said it continues to work with Michigan and Colorado to conduct H5N1 seroprevalence investigations among dairy farm workers with potential exposure to infected cattle. Specimens from both states will be tested by CDC for the presence of neutralizing antibodies to these viruses, a sign of prior infection.

FOODSERVICE SALES

US foodservice sales are expected to rise 5.4% this year, to more than \$1.1 trillion, according to a National Restaurant Association report. That's up from more than \$1 trillion in 2023 and \$864 billion in 2019, the year before the pandemic. The COVID-19 pandemic devastated the restaurant industry, but sales are now far higher than before they started — and climbing. Despite big financial pressures on restaurateurs, such as tech investments and the cost of labor and food, technology is helping in automating order-and-delivery systems.

The rise of virtual kitchens and ghost restaurants, fueled by the growth of online food delivery services, is transforming the traditional restaurant model. These establishments operate without a physical storefront, focusing solely on fulfilling orders through delivery apps. This trend is reshaping the industry's dynamics, presenting challenges and opportunities for restaurateurs

Doordash captured 55% of US food delivery sales. Doordash also saw its revenue rise by about 226% in 2020, blowing past its competitors. Uber Eats and Grubhub are fighting for second place

SUMMARY • Because of high interest rates and inflation, consumers' spending power is under significant pressure. They will continue

- to look for value both in their retail selections and in the foodservice industry. • As the restaurant industry regains its footing, volume has shifted to drive-throughs, home delivery and more convenience
- opportunities versus white tablecloth and super premium offerings. • Consumers learned to cook during COVID and are cooking more meals at home.
- Beef will continue to be tight through 2025.
- Because chicken production can be increased much faster it will take some of the slack up from beef.
- Consumers continue to explore boulder flavors and ethnic offerings.
- Avian flu will continue to be an issue as it mutates and takes other forms Dan Emery has 25 years experience in the food industry, including 15 as vice president of marketing at Pilgrim's Pride. He is directing

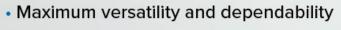
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NCBA

BY HAILEY THAYN

TODAY'S BEEF CONSUMER AT A GLANCE

- Despite an evolving economic landscape, consumers remain cautious about the future, despite ongoing concerns about high prices and economic uncertainty.
- Consumers are spending more on essential items while cutting back on discretionary spending such as dining out and leisure activities.
- Consumers are adjusting their budget priorities and finding ways to stretch their dollars.
- Even with higher prices, beef demand remains resilient, supported by robust reported consumption and retail performance, underscoring consumers' preference for beef. • While brick-and-mortar stores will continue to dominate grocery shopping, food e-commerce expects steady growth and
- remains a viable channel for beef sales. **INTRODUCTION**

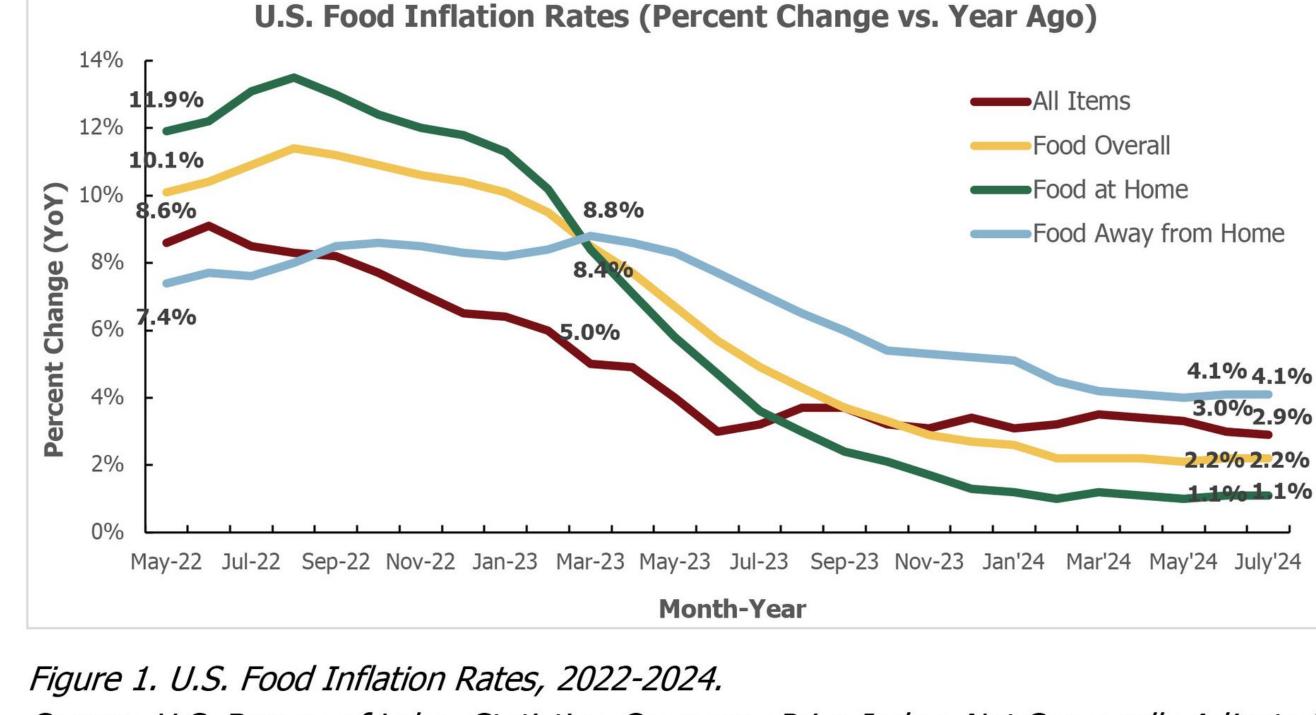
While seeing areas of economic improvement, consumers remain wary of the future. The National Cattlemen's Beef Association

(NCBA), a contractor to the Beef Checkoff, continuously tracks trends, monitors issues, and stays abreast of the trends that have potential to impact the beef industry to better understand Today's Beef Consumer. THE CONSUMER LANDSCAPE

Despite some positive economic indicators, consumers remain cautious about future conditions. The University of Michigan's

Consumer Sentiment Index increased modestly in August 2024 to 67.8, the second lowest level of 2024, reflecting ongoing concerns about high prices and economic uncertainty. 1 Key worries include inflation trends, the prime lending rate, global instability, and pressures about food away from home, shelter, energy, and insurance. While inflation cools from the 2022 highs, prices remain higher than pre-pandemic levels and continue to strain household budgets.

Food away from home prices also remain elevated, up over 4% year-over-year.3 As a result, consumers often look for cost-saving measures in their food purchases and dine out less frequently.²



Source: U.S. Bureau of Labor Statistics, Consumer Price Index, Not Seasonally Adjusted, July 2024 release.



12 months, the CPI for meats, poultry, fish, and eggs has increased 3.0%, driven by factors such as strong consumer demand, increased production costs, disease outbreaks, and supply chain issues. For instance, beef and veal prices have increased by 4.5%, while chicken and pork prices have gone up by 1.7% and 3.6%, respectively. Egg prices have also surged, with a 19.1% year-overyear gain.³ In contrast, dairy and related products have decreased by 0.2%, and fish and seafood have dropped 1.6%.³ When looking at the overall inflationary landscape, it is encouraging to see CPI hover in the 3% range for all of 2024. In July of 2024,

While year-over-year food away from home costs have exceeded overall food inflationary levels since February of 2023; food at

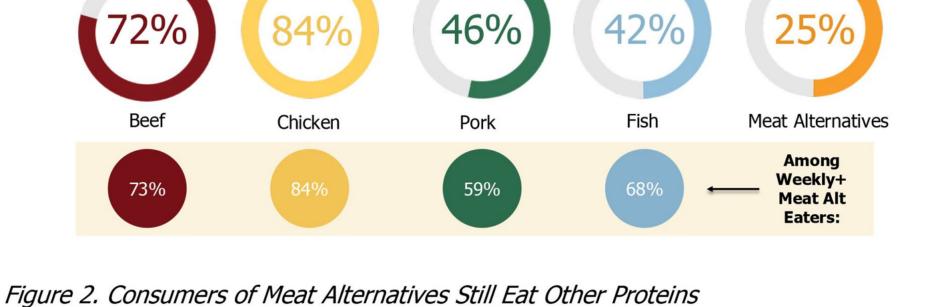
home levels have maintained the 1% range in 2024, a significant turn-around from over 13% mid-summer of 2022. Over the past

the CPI dropped below 3% for the first time since March of 2021.³

Beef consumption and sales trends

Year-to-date beef prices through Aug. 10, 2024, averaged \$6.58/lb., up 6.3% versus a year ago. Over the same time period, chicken prices rose 0.8% and pork prices increased 4.6%.4 Nonetheless, consumption and demand remain robust, as indicated by consumer-reported consumption and retail sales data. A

large majority of consumers eat beef and chicken at least once per week. While consumers continuously perceive beef to be second to chicken in terms of value for the money, beef leads in taste and versatility, driving its demand and affecting consumption and preference. Consumers plan to purchase more chicken and ground beef, but less beef steak, pork sausage and deli meats. Percent (%) of Consumers Eating Each Protein Weekly+



Beef Checkoff, January-June 2024. The total value of fresh meat sales year-to-date rose 5%, driven by a 4% price increase, while the total pounds sold saw a modest gain of 0.9%. Beef led the growth in the fresh meat value with a 6.9% increase, supported by higher retail prices. Within the beef

category, ground beef value rose by 8.7%, and steak value increased by 6.3%. While the overall value of beef is showing gains in

Source: Consumer Beef Tracker, analyzed and summarized by NCBA, on behalf of the

2024, the total pounds of fresh beef sold held a modest increase of 0.6%, with ground beef up by 2.5%, offsetting declines in other cuts like roasts and briskets.⁴ Fresh Meat sales nearly \$40 Billion through 8/10/24 Retail Fresh Meat \$ 'FY'24 ending LBS. 'FY'24 ending



Sales, 2024 ending

8/10/24



8/10 v. YAGO

8/10 v. YAGO

Other proteins are experiencing mixed gains across various cuts. Dollars and pounds sold for chicken are both up, while pork is up in dollars sold but down in pounds. 4 Meat alternatives continue to struggle, with declines in both total value and pounds sold, despite an increase in price per pound.⁴ This trend suggests that consumers still favor traditional meat products over alternatives. When reviewing our latest consumer beef tracker data, meat alternative consumers also consume beef and other animal proteins as much,

if not more, than the average consumer, as indicated in Figure 2.⁵ It appears that they are adding these alternatives for variety rather than substituting other proteins. **Stretching dollars: cost-saving strategies** According to Statista, 52% of U.S. consumers identify "rising prices/inflation/cost of living" as their biggest challenge. ⁸ This economic pressure continues influencing shopping habits and decision-making, with consumers prioritizing essential items and

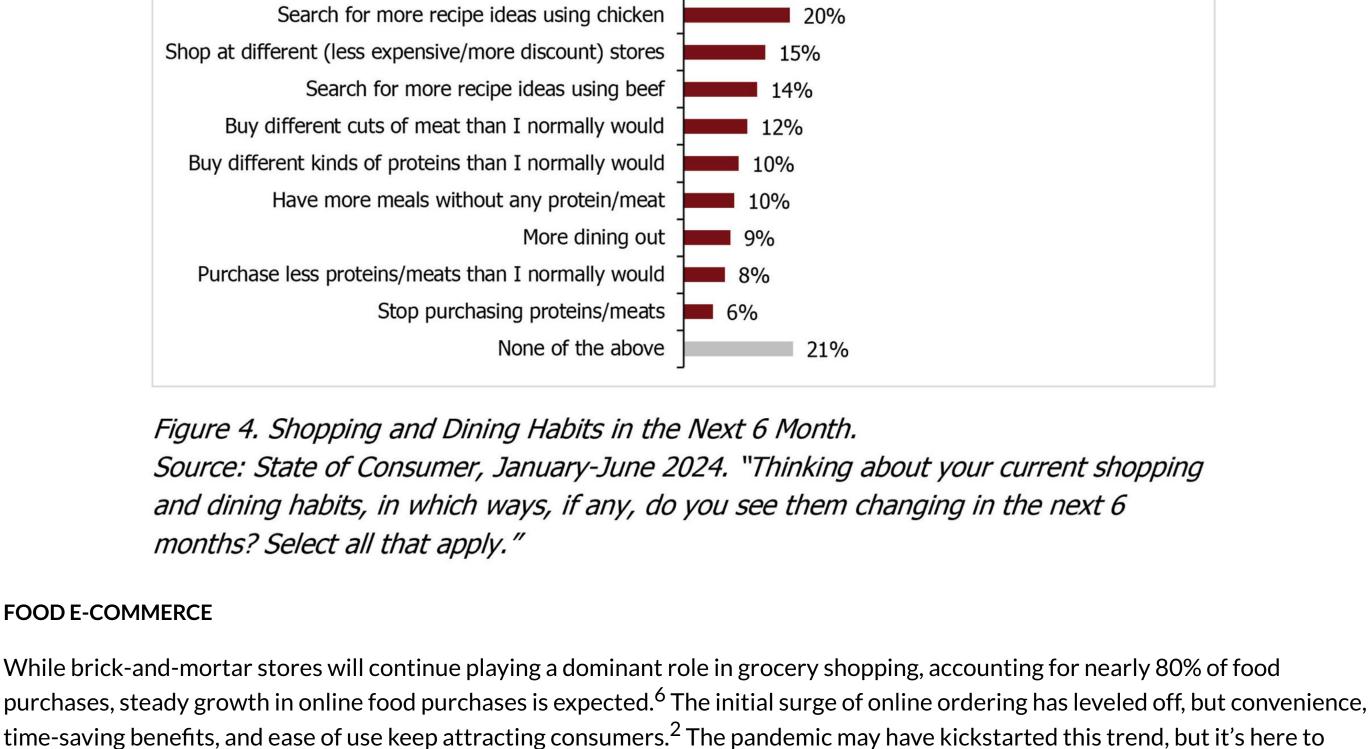
spending more cautiously. Recent survey data covering the first six months of 2024 indicates consumers are looking for ways to save money. About 35% of

consumers reportedly have more meals at home and plan to continue this trend. In fact, around three-quarters of meals are being prepared at home. Conversely, consumers are dining out less frequently due to the high cost and cutting back on discretionary spending.² By doing so, consumers can better allocate their budgets toward essential items like groceries, especially as many

consumers have reported increased grocery spending in the last six months, likely driven by higher store prices.²

Consumers are also adopting various cost-saving strategies to stretch their dollars further. About one-third of consumers actively seek out deals or coupons, and some opt for store or private labels that offer quality products at lower prices. According to Kantar, about 46% of shoppers plan to buy more private labels over the next year, compared to 27% saying the same for national brands.⁷ Additionally, consumers are becoming more strategic with their meals and food planning. More than one-quarter of consumers are reusing leftovers or stocking up and freezing items to maximize their food supply and savings.² As economic uncertainties persist, consumers will continue prioritizing these habits, ensuring they get the most value for their money.

Shopping and Dining Habits in the Next 6 Months Look for deals or use coupons more often Less dining out 36% Find more ways to use leftovers 28% Stock-up/freeze items more often 27% Buy store or private label brands instead of name. 21%



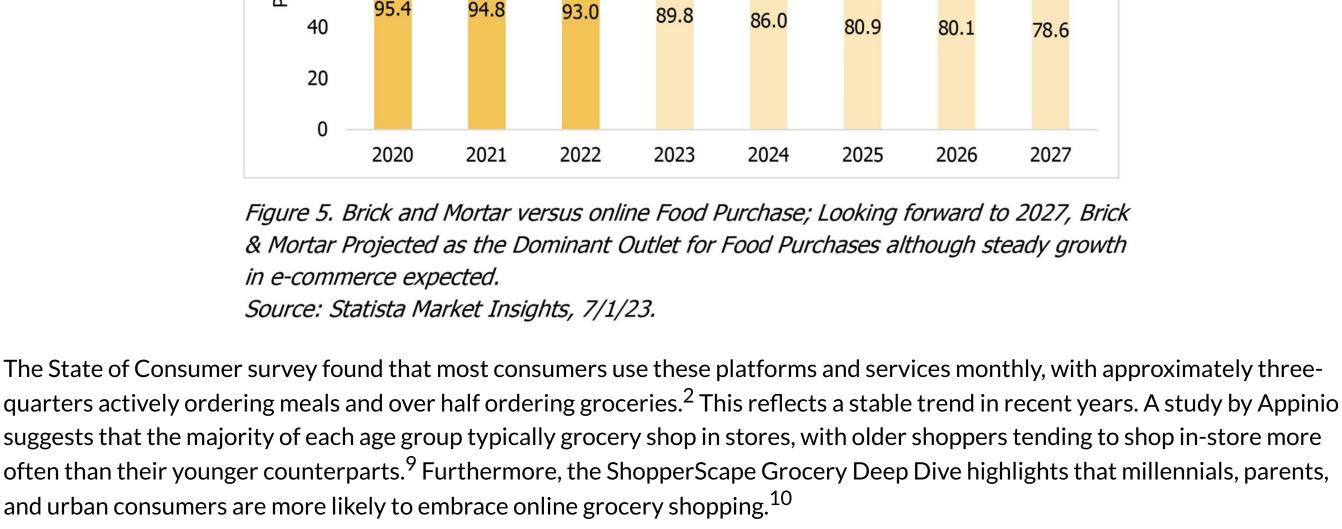
Brick and Mortar versus Online Food Purchase Offline Online 120

10.2

14.0

19.1

21.4



often than their younger counterparts. Furthermore, the ShopperScape Grocery Deep Dive highlights that millennials, parents, and urban consumers are more likely to embrace online grocery shopping. 10 Online shopping carts typically contain non-perishable packaged goods and dairy products.² Approximately 25% to 45% of online shoppers include fresh proteins in their purchases.² Notably, 36% of online shoppers included fresh beef in their carts recently, and most were satisfied with their purchase.²

pressures persist. In response, consumers continue finding ways to stretch their budgets, whether by enjoying more meals at home, searching for deals, or opting for lower-cost alternatives. Additionally, the food e-commerce sector expects steady growth in the coming years, reflecting consumer's preferences for convenient shopping solutions.

While there are signs of relief, such as moderating inflation rates and a slight uptick in consumer confidence, overall inflationary

CONCLUSION

stay.

SOURCES 1. University of Michigan, Consumer Sentiment Index, August 2024.

- 2. State of Consumer, analyzed and summarized by NCBA, on behalf of the Beef Checkoff, January-June 2024. 3. U.S. Bureau of Labor Statistics, Consumer Price Index, Not Seasonally Adjusted, July 2024 Release.
- 4. NielsenIQ, Discover, Year to Date Retail Protein Sales, week ending 8/10/24. 5. Consumer Beef Tracker, analyzed and summarized by NCBA, on behalf of the Beef Checkoff, January-June 2024.
- 6. Statista Market Insights, 7/1/23.
- 7. Kantar, FMI, "The Power of Private Brands 2024" report.

100

80

60

Percent

- 8. Consumers in the U.S., Statista Consumer Insights, June 2024. 9. Appinio, "Where Consumers Usually Purchase Groceries in the United States in June 2023, by Age Group." Statista,
- 10. ShopperScape Grocery Deep Dive, February 2021, 2022, 2023, and 2024.

Opening image credit: GettyImages / pixdeluxe

Statista Inc., August 2023.

UP NEXT >>

SOTI - CHICKEN









MEAL KITS, PACKAGING THAT OFFERS NO MESS, AND LABELS WITH INFORMATION ON NUTRITION APPEAL TO YOUNGER SHOPPERS.

BY TOM SUPERNATIONAL CHICKEN COUNCIL

BROILER PRODUCTION OUTLOOK

Chicken in the year ahead, if not significantly longer, has a semi-golden opportunity to become an even more important player in the agricultural animal sector and in consumers' diets. But, for a few reasons, it is difficult to characterize the opportunity ahead as being "solid" gold.

Chicken production increases in recent years have been somewhat muted when compared against the long-run historical average annual gain, but chicken production monthly percentage increases since mid-2024 have been running at rates above the five-year average. This has some analysts signaling the beginning of stronger output gains in 2025 and beyond. Abundant corn and soybean harvests have made feed costs more manageable for broiler production.

Paramount to this semi-golden outlook is the downturn in the beef cattle cycle. Most cattle analysts expect that 2027 will be the earliest time when the beef cycle begins to turn upward, and more than a few analysts see the timetable extending beyond 2027.

Cold storage chicken inventories are measurably under year-ago levels as well as under the five-year average. Analysts tend to evaluate this trend as a positive demand development. Egg sets on a percentage change have been aligning closely with the five-year average but have begun since mid-2024 to tick-up.

With per capita chicken consumption over 100 pounds, it will be increasingly necessary to develop new successful products for both the at-home and away-from-home markets. Affordability will continue to be most important to most consumers. Savory, tasty products that appeal to a broad range of consumers can help make premium products have a better opportunity to overcome the food budget constraints.

CHICKEN POISED TO MEET THE NEEDS OF CONSUMERS IN 2035

In the decade ahead, fast prep time, easy-to-prepare, single-serve packaging and other time savers will be priorities for Gen Z and younger Millennials who buy fresh chicken, according to recent research that was presented at this year's Chicken Marketing Summit.

67% of Gen Z say that fast prep will be a priority in five years. Meal kits, packaging that offers no mess and labels with information on nutrition are especially appealing to Gen Z who in five years will likely be in a different stage of lifestyle, balancing work and families.

Based on the research findings, chicken companies were given recommendations to:

- Make it easy for consumers to choose, buy and prepare chicken meals fast;
- Reinforce the established benefits of chicken; consumers are resistant to plant-based and lab-grown meat alternatives;
- Offer transparency for sustainable practices and other practices related to social causes and the environment.

Three-quarters (76%) of consumers indicated that corporate responsibility matters to their purchase decisions for food. Gen Z is most likely to care about social causes; Gen Z and Younger Millennials are most likely to care about transparency in sustainability initiatives. From the farm to the supermarket, chicken companies have a great sustainability story to tell. In addition to health, taste and value, this can firmly establish the relationship with the younger generation of consumers, maintaining chicken's position as the preferred protein.

HIGHLY PATHOGENIC AVIAN INFLUENZA

and

The chicken industry will continue to operate all of their live production farms with the strictest safeguards against highly pathogenic avian influenza (HPAI), a disease that continues to inflict worldwide damage to poultry. Although broiler farms have been fortunate with avoiding HPAI compared with other poultry species, that good experience provides only limited assurance that damage will not occur in the future.

REGULATION AFTER REGULATION

To be sure, Salmonella is a potentially dangerous food-borne bacteria. It occurs naturally in chickens. That's why we stress the need to always cook chicken to an internal temperature of 165°F and to avoid cross-contamination in the kitchen. When those steps are followed, there is absolutely no danger of food-borne illness from chicken.

Chicken producers work continuously and closely with US Department of Agriculture (USDA) to reduce the presence of Salmonella in and on chicken. The industry has implemented new controls and interventions and supported modernized poultry inspection. As a result, we are meeting and exceeding USDA's rigorous food safety standards.

Yet, USDA's Food Safety and Inspection Service (FSIS) on July 29th published its wide-ranging and complex Salmonella Framework for Raw Poultry Products proposed rule that would fundamentally alter how raw chicken is regulated... and granted industry just 60 days to analyze and comment on the rule.

NCC and the chicken industry attempted to engage with FSIS for the past two years during the formulation of this proposed Salmonella Framework, and unfortunately, our input was largely disregarded.

This proposal will raise the price of chicken and cause millions of pounds of safe-to-eat, if properly prepared, chicken to be sent to landfills rather than dinner tables – an unconscionable thought given there are 44 million Americans who are food insecure.

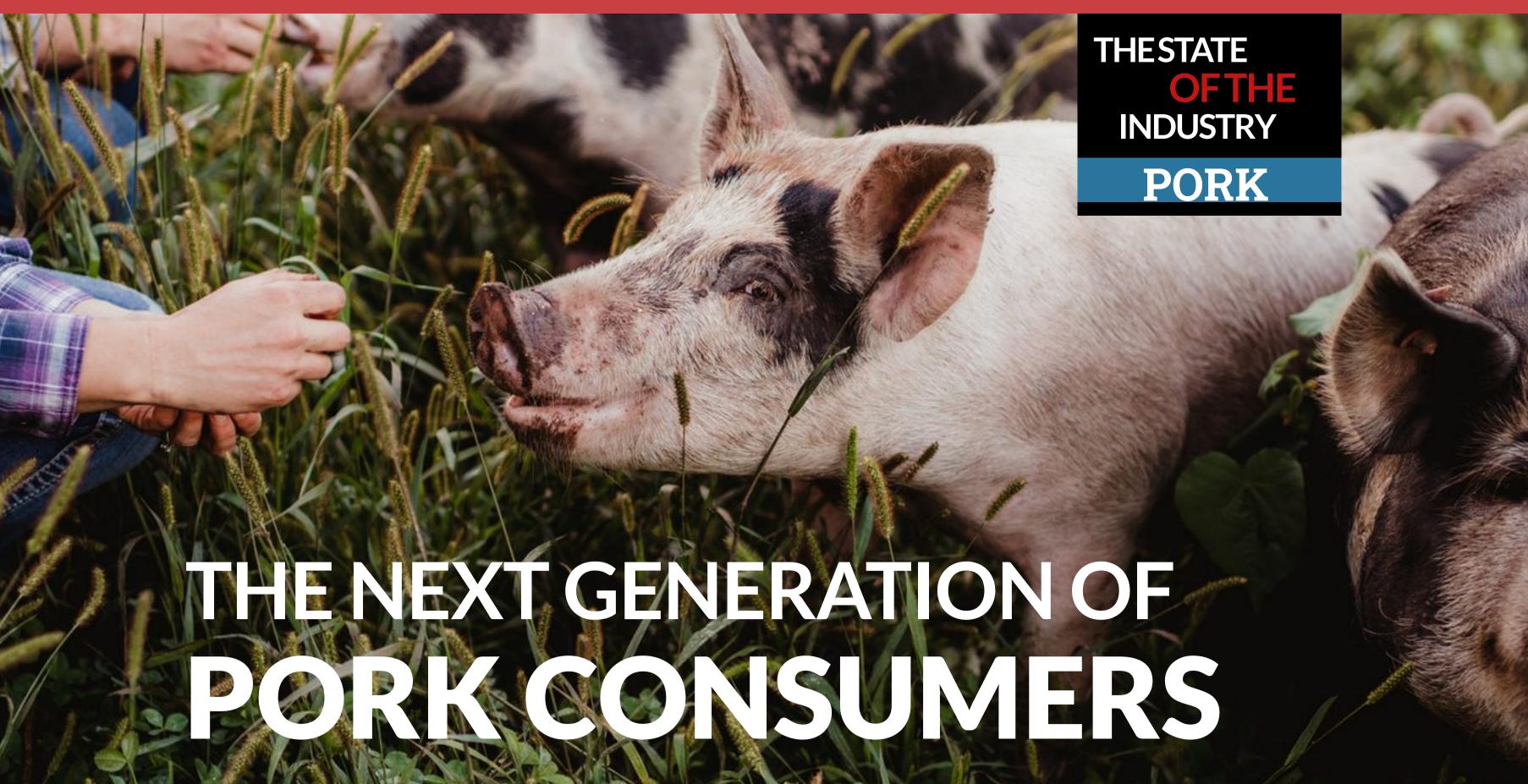
We remain committed to further reducing Salmonella and fully support changes in food safety regulations that are based on sound science, robust data, and are demonstrated to positively impact public health. However, we are concerned this proposal is not based on any of those.

CONCLUSION

America loves chicken. It's a healthy, economical and versatile source of protein that sustains our country and is arguably the most important food in the world. NCC in 2025 will continue to keep it safe, affordable and on our plates.

Tom Super is senior vice president at the National Chicken Council.

Photo credit: Getty Images / deepblue4you / Getty Images Plus



PORK INDUSTRY MUST EMBRACE OPPORTUNITIES TO CONNECT WITH YOUNGER DEMOGRAPHICS.

BY JASON MENKENATIONAL PORK BOARD

In this summer's Olympic Games in Paris, 385 bronze medals were awarded to competitors from more than 200 countries. In a premiere global sporting event that occurs once every four years, third place is something that most athletes only dream of but very few achieve. For the National Pork Board (NPB) and the 60,000 pig farmers it represents, third place seems like second best.

Domestic pork consumption during the past few decades has been stagnant. Ignoring the boon that the COVID-19 pandemic was for the retail meat case and pork in particular, the long-term trend has remained flat to declining on a pounds-per-person-per-year basis.

"We've been stuck at the plateau at about 50 pounds per person per year for the last several decades," said Patrick Fleming, NPB's vice president of demand development. "While we didn't necessarily lose ground, we're losing our key customers, and we've got to start making the case for pork with younger generations."

Fleming noted that it's a pivotal moment for the pork industry, which has consistently remained behind beef and chicken consumption in the U.S.

"Baby Boomers have a high affinity for pork, but they're aging out," he adds. "Unfortunately, the younger generations – Millennials and Generation Z especially – don't have the same perceptions and love for pork as their parents and grandparents."

To move the consumption needle in a positive direction, NPB is working to help the industry understand the importance of making pork more relevant and relatable to younger Americans, encouraging them to eat more pork more often.

Grounding the pork supply chain in this reality is imperative, but not without its challenges. While previous generations could be reached en masse through television, radio and print media, today's digital world has made a "one-size-fits-all" approach to connecting and remaining relevant and relatable to consumers difficult.

NPB's Consumer Connect is the first step in building pork relevance among younger consumers. The work is backed by extensive and sophisticated market research funded by Pork Checkoff dollars that includes food supply chain sales, purchase patterns, retail, and meat case behavior, as well as a greater understanding of the motivations, drivers, and attitudes about pork and food in general.

NPB worked with a company specializing in consumer market segmentation, data providers, and market research consultants to identify and categorize seven distinct consumer segments. The segments were identified by conducting:

- An online anthropology that analyzed 20 million social media posts from approximately 5 million accounts
- An online quantitative survey of more than 7,500 consumers
- A five-day online qualitative community analysis of 60 consumers
- 28 in-depth one-on-one discussions with consumers

Additionally, the segmentation typing tool is tied into Numerator data, which tracks the shopping and purchasing habits, media preferences, and psychographics of shoppers in the U.S.

The end result? More than 50,000 households (which were then projected up to 150,000 shoppers) were classified into specific segments that allow the Pork Board to monitor and measure pork performance and key metrics by region, retailer, and across the U.S. This also enables the Pork Board to better understand consumer habits as they move to food service channels.

According to Kiersten Hafer, NPB's vice president of data and insights, Consumer Connect significantly differentiates from segmentation work done by commodity marketing groups.

"Most segmentation strategies stop at identifying consumer groups," she explained. "Our work identifies the people in each segment, but we also know how to find them and talk to them about the things they care about. We have tied each segment to specific growth strategies. We have segments we need to protect, but we've also identified segments where pork has growth opportunities – both in the short term and long term."

By going beyond the "who" and into the "how and why," Consumer Connect allows brands to take the data and move more quickly into informed activation strategies.

"The value to the pork supply chain can't be overstated," Hafer noted. "These insights allow the industry to focus on our most important consumers and help craft better-informed strategies that create actionable consumer pull-through strategies that packers, retailers, and food service partners can fund confidently.

To date, NPB's market growth team has held more than 50 meetings with C-suite-level individuals of supply chain partners of every type and size to showcase the Consumer Connect playbook. The strategies outlined in the playbook identify how supply chain stakeholders can implement this research into their own branding and marketing.

"Helping decision-makers understand where and how to impact their brands and businesses was at the core of the work, and why we invested so heavily," Hafer said. "This work has brought key investments, initiatives, and progress in areas like sustainability, nutrition, and demand together in a way that hasn't been possible before now."

Hafer points to several examples of how supply chain partners have used the insights, including:

- As a basis for brand and innovation research for brand development.
- Implementing the consumer-typing tool for their own research and/or coding it into their own custom segmentation.
- Positioning and selling branded products with segments as their priority targets.
- Tiering brands and messaging
- Reviewing current branded offerings, product innovation, and products in the pipeline through the lens of consumer needs and wants.
- Evolving trade promotion plans and evaluating the brands, products, and merchandising materials used throughout the shopper journey.
- Ideating menus and new limited-time offers featuring fresh pork as an ingredient.
- Tracking issues and understanding which segments need to be prioritized based on topics that could pose a risk to their confidence in pork.

"This is the best time in the past 40 years to reposition pork for the long term," Fleming said. "We have generations that don't have the affinity for pork like Boomers did. While that could be interpreted as a threat to our future success, we have a blank slate to engage younger Americans around what matters to them, build a brand they love, and share the flavors and versatility that are unique to pork."

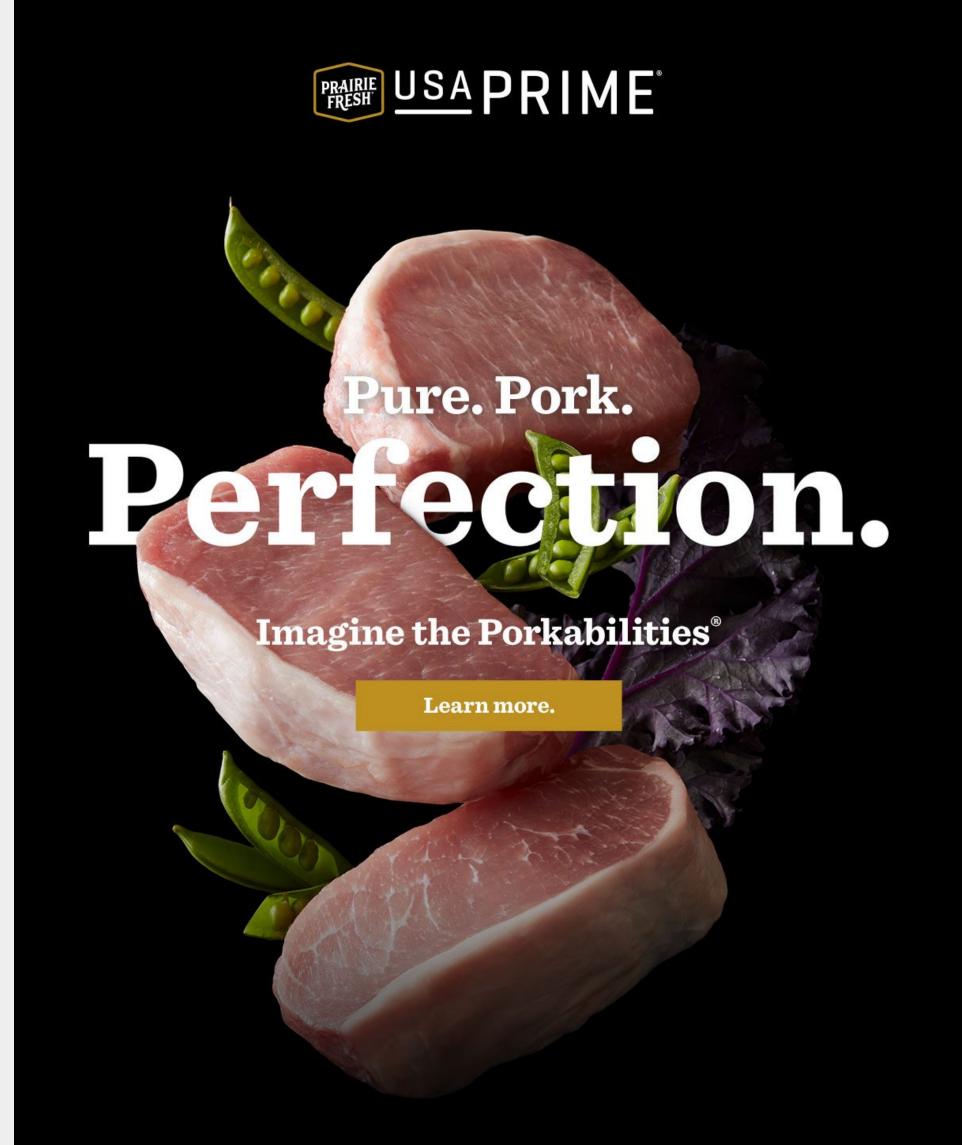
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INDUSTRY

AGENDA

TURKEY INDUSTRY PARTNERS WORK WITH USDA AND CONGRESS TO SAFEGUARD THE INDUSTRY.

Despite a whirlwind of challenges and uncertainty caused by pressing animal health issues, the U.S. turkey industry is thriving with dynamic activity. Throughout 2024, the National Turkey Federation (NTF) and its members have been advocating for animal health solutions at the federal level, educating consumers on the benefits of including turkey in their diets year-round and promoting turkey products both domestically and abroad.

NTF ON CAPITOL HILL: FARM BILL AND BEYOND

The upcoming Farm Bill is top of mind for the agriculture sector. NTF has facilitated several virtual and in-person meetings with federal lawmakers to ensure Congress remains apprised and committed to including NTF's legislative priorities related to animal disease prevention, programs to expand international markets, food safety and more in the final bill.

While progress is being made on the Farm Bill, this process requires significant time and careful consideration. In the meantime, NTF and our members are dedicated to positioning the industry to effectively address animal health challenges and other issues essential to advancing the industry. Ongoing turkey health challenges, such as avian metapneumovirus (aMPV) and highly pathogenic avian influenza (HPAI), were priority topics for discussion at the NTF Leadership Conference in mid-September, which is the industry's grassroots lobbying event dedicated to growing the industry's visibility on Capitol Hill. We look forward to continued collaboration with industry partners, USDA and Congress to shape policies that will safeguard the industry for years to come.



BY LESLEE ODEN

NATIONAL TURKEY

FEDERATION



HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI)

This year, the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) has confirmed the loss of over 1 million turkeys due to the unprecedented HPAI outbreak. In total, more than 14 million turkeys have been lost since the outbreak began in February 2022. While there has been a recent decrease in detections for commercial poultry operations in the U.S., HPAI H5N1 affecting U.S. poultry, domestic livestock and humans has added an extra layer of complexity to addressing the evolving situation. In response, NTF is urging USDA to establish a HPAI Strategic Initiative that engages the brightest minds within industry, universities and government to expand our knowledge and develop novel methods to prevent, detect and respond to avian influenza. Through the initiative, USDA would allocate funds and oversee a program of research projects that address the outstanding questions related to HPAI prevention, detection and response. It is crucial that additional research and mitigation tools are developed to help the turkey industry recover from these significant losses and prevent further outbreaks in commercial operations.

NTF along with the National Chicken Council, United Egg Producers, USA Poultry & Egg Export Council (USAPEEC) and the U.S. Poultry & Egg Association (USPOULTRY) initially sent a letter to USDA in mid-July urging the agency to consider establishing the initiative. Since then, NTF has garnered support from several federal lawmakers urging USDA to establish a HPAI Strategic Initiative. NTF is appreciative of the support and stands ready to work collaboratively with USDA, Congress and other agriculture associations affected by HPAI to further outline and prioritize the research objectives needed to answer the complex questions

associated with the disease. AVIAN METAPNEUMOVIRUS (AMPV)

Avian metapneumovirus (aMPV) continues to be a growing threat to the American turkey industry. The respiratory disease has been detected in every poultry producing state in the U.S., including in a large amount of turkey operations, and is the probable cause of low U.S. inventories of turkey eggs in incubators. NTF estimates that the virus is present in 60 to 80 percent of U.S. turkey flocks, with over 1,500 detections since February 2024. However, USDA does not officially track aMPV cases, which complicates data collection. To help protect U.S. commercial turkey flocks and mitigate the impacts of the disease, NTF is advocating for USDA to approve the import of commercial modified-live aMPV vaccines to protect turkeys now while pursuing a long-term strategy for developing a domestic, commercial vaccine. Currently, regulatory approval for a commercial aMPV vaccine domestically does not exist, however outside the U.S., both live and inactivated vaccines are commonly used to immunize both turkeys and chickens

In early September, nearly a dozen U.S. Senators led by Sens. Amy Klobuchar (D-MN) and John Boozman (R-AR) penned a letter to USDA urging the agency to approve the import of these vaccines to protect commercial poultry flocks from aMPV. NTF has engaged with USDA's Center for Veterinary Biologics (CVB) since the beginning of the aMPV situation and hopes action will be taken soon by the agency to provide turkey growers, veterinarians and animal health officials with the tools to curb the spread of the disease and prevent additional poultry losses. NTF looks forward to further collaboration with Congress and USDA officials to develop a strategy that ensures the deployment of all available treatments for this disease, as risks to turkey health and the future of turkey production continue to grow.

FSIS' SALMONELLA FRAMEWORK PROPOSED RULE

Since the release of USDA's Food Safety Inspection Service's (FSIS) Proposed Regulatory Framework to Reduce Salmonella Illnesses Attributable to Poultry in 2022, NTF and its members have actively contributed industry data to the FSIS Salmonella Risk Assessment and maintained an ongoing dialogue with the agency to identify effective, practical solutions that build on the turkey industry's ongoing efforts to combat Salmonella throughout turkey production. Regarding the Salmonella Framework, while NTF believes that FSIS already possesses the authority and regulatory tools necessary to drive improvements in food safety without implementing a final product standard for Salmonella in turkey products, we are diligently reviewing the proposal so we can provide meaningful comment. NTF believes any standard should be science-based and should not impose unnecessary costs and product destruction for members of the U.S. turkey industry. As we delve deeper into the Salmonella Framework, NTF is committed to continuing our engagement with FSIS to develop comprehensive strategies that will advance this crucial priority while reflecting the concerns of NTF members expressed throughout this policy progression.

HOLIDAY SEASON

As we enter the holiday season and round out the year, we're excited to see turkey take center stage on tables nationwide, along with other cuts of turkey meat and products featured in holiday spreads. NTF has been focused on boosting demand for turkey products by leveraging social media to deliver recipes and creative meal ideas directly to consumers in addition to amplifying turkey's place in barbecue through Turkey Smoke, a marketing program dedicated to growing turkey's presence on the grill and smoker. NTF and its members will continue to actively engage consumers, promoting turkey as a versatile choice for any meal, from morning to night.

Additionally, NTF anticipates another successful National Thanksgiving Turkey Presentation will take place at the White House this year where two turkeys from the 2024 presidential flock, being raised by NTF Chairman John Zimmerman and his family in Minnesota, will receive a pardoning from the president of the United States. This cherished event signals the beginning of the holiday season and highlights the crucial role of the U.S. turkey industry in American agriculture. Stay tuned for more details on this beloved annual tradition.

NTF is thankful for the hard work and dedication of everyone involved in the production, processing and delivery of turkey products – especially over the past few years as we've faced HPAI head-on. The turkey industry remains resilient, and we look toward 2025 with a strong determination to persevere.

Leslee Oden is NTF's president and CEO.

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PROCESSORS MUST CHANGE THE PERCEPTION THAT THE INDUSTRY DOESN'T CARE ABOUT CUSTOMERS AND ARE MAKING AND SELLING UNSAFE PRODUCTS.

BY ANDREW LORENZWE R FOOD SAFETY!

Not only have there been multiple recalls of meat and poultry products that have been linked to human illness, but there have also been multiple linked to deaths, entire plants shuttered, and per a recent Gallup poll the American people are losing confidence in the food industry.

Do we need more regulations? No, what we need is more focus on the basics.

For livestock we need to have better controls preharvest. This is something we have very little control over. USDA FSIS is pushing very hard for preharvest sampling followed by reacting to said results. Unfortunately, short of refusing to harvest the animals, most harvest facilities have already implemented multiple interventions giving them very little additional interventions that they can implement. Add to it the public is becoming very resistant to chemical treatments. Ultimately, we need USDA APHIS to step up and develop better controls that our farmers, ranchers and feedlots can implement to reduce pathogen load. Robust sanitary dressing procedures have been and will be our first and best line of defense.

For our raw intact processors, we need to focus on temperature control and basic sanitation. Automated temperature control, frequently taking internal product temperatures in unrefrigerated processing spaces and keeping said temperature as low as possible. If any of the trim from these processes is headed to raw not intact processing we need to apply an antimicrobial intervention prior to processing, the risk of viable non-culturable cells being present on primals, is just too high of a risk.

For raw not intact processors temperature controls and basic sanitation need to be our focus. Grinders, mixers, extruders, needlers, etc., all have the potential to increase product temperature during processing as well as the potential introduction of foreign material into product. What do you have for temperature controls? I recommend you map your process to determine where your highest temperature is in your process and put the appropriate controls in place.

For foreign material, and this applies to any food production category, it starts with your receiving program then moves to your preoperational checks. When the cleaning team is disassembling your equipment are they trained to inspect the equipment for damage? Do they know how to properly report it if there is damage? Does your food safety team know how to properly investigate and find the contamination?

Post lethality contamination prevention is critical. Does your sanitation team use multiple sanitizers that are rotated? Are all of your food contact surfaces in good condition so that those sanitizers can work? If you do have areas that are hard to reach or have liquid restrictions are you using vaporized alcohol? Remember water tension for most liquid sanitizers is approximately 72.8 dynes/cm compared to 22.3 for alcohol vapor, i.e., it is very effective at getting into those hard-to-reach areas.

Are your sampling programs truly robust, are you actively looking for Listeria? When you have a positive is your team trained on how to investigate, find, and eliminate the harborage points?

Another thing to keep in mind is that while the USDA FSIS compliance guidelines don't require non-food contact surface testing, is it worth it to allow Listeria in your environment and not know about it? This is especially true when you are doing construction, equipment repair or introducing new equipment into your environment.

Ready to eat areas must be kept in good condition. Reading NRs about mold, filth, etc., in ready to eat areas should immediately send a flag to senior management. If senior management isn't being included in USDA FSIS in-plant personal communications they need to become involved immediately. When I read the CDC public notification to not eat deli meats my stomach dropped, it meant they had enough information to go after a complete segment of our industry.

For the majority of our clients we don't stove pipe the food safety program, we analyze each process category and transfer from one food safety system to another. The reason for this is that it forces us to look at each step in our process in detail. When something goes wrong in a lethality or stabilization process we know we had controls in place earlier in our process. Making any modelling or sampling much easier to validate.

Years ago Mr. Steven Cortinez told me his basic philosophy was 1) keep it clean, 2) keep it covered, and 3) keep it cold. It was and still is great advice.

CRYSTAL BALL

We know that polling is reporting people's perceptions. We must change the perception that we as an industry don't care about our customers and are making and selling unsafe products. Nothing could be further from the truth, we are making billions of pounds of safe, healthy, product every year.

Our regulatory authorities will have to respond to the loss of faith by the American people in our ability to provide them with safe product. What that is going to look like, be it additional regulations, more aggressive enforcement, or a combination of the two I don't know; what I do know is that they will be pushed to do something.

The calls for breaking up the Big 4 meat and poultry companies is getting louder; without explaining how this would make product safer.

It behooves all of us to take a hard look at our processes and make sure we have implemented the appropriate controls and communicate it to our customers.

Andrew Lorenz is president and CEO of We R Food Safety!







IN THIS WEBINAR, YOU'LL GAIN VALUABLE KNOWLEDGE ON:

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- The competitive landscape: How meat and poultry processors can stand out and attract top talent amidst competition from other industries.
- Integrating hiring with efficiency: Align your recruitment efforts with broader operational strategies to maximize overall productivity.
- Becoming an employer of choice: Practical steps to enhance your company's appeal and build a workplace where employees want to thrive.

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PACKAGING SHIFTS TO RENEWAY AS A SOUTH OF THE SOUTH OF TH

PRIMARY OBJECTIVES FOCUS ON SUSTAINABILITY AND SHELF LIFE. BY JORGE IZQUIERDO PMMI

Consumers continue to consider sustainability when making purchasing decisions. As a result, producers of meat, poultry, and seafood products are working to reduce plastic usage, especially single-use plastic, and adopt substrates from renewable sources. When plastic packaging is specified, recyclable and recycled-content options help support efforts to establish a circular economy for plastic.

Some companies have embraced a broader perspective on sustainability by vertically integrating the growing of fish and livestock with its processing, packaging, and waste recycling. This reduces travel distance, animal stress, fuel consumption, carbon footprint, and waste disposal costs. It also can simplify serving the e-commerce channel because a streamlined process moves animals from their nearby, sometimes on-site, home through harvesting, packaging, and direct-to-consumer shipping.

The industry also has taken a broad perspective to advance sustainability. For example, participation in the Protein Pact helps producers set targets and collect data related to reducing greenhouse gas emissions and improving animal care, food safety, labor and human rights, and health and wellness. ⁽¹⁾

RENEWABLE PACKAGING OPTIONS

Packaging material providers have been hard at work developing recyclable fiber-based paperboard or corrugated alternatives to polyethylene, polyethylene terephthalate, polypropylene, expanded polystyrene foam, and nonrecyclable wax-coated paperboard/corrugated. These innovations for primary, secondary, and distribution packaging achieve moisture resistance via an easily separated film layer or a food-grade coating, which does not affect recyclability. Some tray designs can be printed to provide an upscale presentation and/or reduce the need for a separate label or paperboard sleeve/carton. Fiber-based packaging formats often can serve as a drop-in replacement to their plastic counterparts and offer equal or better shelf life along with cost parity or savings. Recyclable fiber-based packaging also can eliminate waste disposal fees incurred with non-recyclable packaging, increase efficiency, and reduce supply chain costs and carbon footprint.

For an even better sustainability profile, paperboard, corrugated, and pulp-based packaging can contain recycled content and may be custom-printed to eliminate the need for separate labeling. Designs can be compatible with skin pack, clamshell, freezable, microwavable, ovenable, and modified-atmosphere products.

In the U.K., Sainsbury's, a major retail chain with hundreds of supermarkets and convenience stores, will save roughly 700 tons of plastic annually by phasing in fiber-based packaging for its private-label fish and chicken products, including salmon fillets, breaded fish fillets, breaded chicken and other chicken products. The paperboard trays are curbside recyclable. A Good to Know logo helps shoppers identify more sustainable products. (2)

Thermoformed fiber trays have been developed as a plastic alternative for chilled cooked meats, cold cuts, and fish. The trays combine lightweight, grease resistance, barrier properties, and operational efficiency with an upscale appearance and are accepted in some curbside recycling programs worldwide.

OTHER OPTIONS

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Other sustainable packaging options include source-reduced materials such as downgauged barrier films. Since each roll holds more material, thinner films offer benefits across the supply chain including lower storage and transport costs, fewer reel changes, and less downtime on the packaging line. Applications include modified atmosphere and vacuum packaging for fresh or frozen products.

Source reduction also is an advantage of polypropylene foam trays, which combine lightweight with stiffness, good machinability, and resistance to impact, water, and grease. However, the material's biggest benefit might be that it is more widely recycled than the traditional expanded polystyrene.

Bio-based, compostable overwrap trays offer another path to improved sustainability. Intended to replace expanded polystyrene, the compostable trays deliver equivalent performance but disintegrate into organic material in industrial composting operations and soil and marine environments without leaving any toxic residue.

Natural Shrimp Inc. has adopted bio-based trays for its e-commerce business, now being served by a dedicated fulfillment center. Each tray holds one pound of "heads-off" shrimp plus an absorption pad to soak up any stray moisture. Vacuum sealing protects freshness. Five trays are packed per box for direct-to-consumer delivery. (3)

Other tactics to enhance sustainability include the adoption of linerless pressure-sensitive labels, which reduce costs and waste by eliminating the liner.

Whatever the sustainable packaging choice, communication with consumers also is vital. No packaging initiative can succeed without consumer buy-in. Thus, many brands are investing in educating customers about proper disposal practices, recycling protocols, and the environmental benefits of the materials used. Labels often include detailed recycling instructions, encouraging consumers to make responsible choices. However, environmental claims should be backed by facts. Certification by a third-party organization provides transparency, reassures consumers, and forestalls accusations of greenwashing. Organizations involved in certification include the Biodegradable Products Institute (compostability), Forest Stewardship Council (sourced from well-managed forests or recycled fiber), and the How2Recycle Label Program (assesses recyclability).

Producers of meat, poultry, and seafood products will find the latest sustainability innovations at PACK EXPO International (Nov. 3–6, 2024; McCormick Place, Chicago). Making its PACK EXPO International debut, Sustainability Central (located in West Hall, Booth W-21020) will take an expansive look into packaging sustainability and what it means to brands, including expert speakers, and a look at actionable, sustainable solutions in manufacturing, materials, recovery, logistics, analytics, and design. Attendees will hear from industry experts on a range of packaging sustainability topics and learn how to make their brands more sustainable.

Processing and packaging innovations also will be found at the Processing Zone on the upper level of Lakeside (LU), the Logistics Pavilion in the North Hall (N), and Emerging Brands Central (Booth W-20049), a new show feature offering 30-minute presentations on product development, packaging innovation, and scaling strategies.

Other educational sessions will be offered in multiple locations: the Innovation Stage (Booth N-4560, N-4580, and N-4585), Processing Innovation Stage (Booth LU-7147), Industry Speaks (Booth N-4565), and Reusable Packaging Learning Center in the Reusable Packaging Pavilion (Lakeside, upper level). With more than 150 educational sessions on the show floor, PACK EXPO International is a hub for education and thought leadership where industry experts share timely knowledge on the latest topics and trends in packaging and processing.

Networking opportunities also abound. The PACK gives BACK[™] event features a comedy performance by Nate Bargatze and benefits the PMMI Foundation. Other networking activities include the Packaging & Processing Women's Leadership Network Breakfast featuring Lisa Sun, the Young Professionals Network Reception, and a full schedule of activities for students such as the Future Innovators Robotics Showcase, the PACK Challenge, and the Amazing Packaging Race.

The most expansive and all-encompassing packaging and processing industry event, PACK EXPO International, will feature 2,500 exhibitors offering solutions to many of today's biggest manufacturing needs from an intersection of industries to 40-plus vertical markets. More than 45,000 attendees from consumer packaged goods and life sciences companies worldwide will converge, searching for innovation, connection, and insight. For more details and to register, go to packexpointernational.com.

By Jorge Izquierdo is vice president of market development for PMMI.

- ¹ Meat Institute. Meat Institute Announces Ambitious Climate Target, Releases Sustainability Framework, News Release, Nov. 9, 2021.
- ² Riley, Sean. Sainsbury's Extends Pulp Packaging from Steak to Fish/Poultry, Packaging World, June 17, 2024.
- ³ Natural Shrimp, Inc., Natural Shrimp E-Commerce Update, News Release, May 9, 2024.

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ADVANCES ACROSS LIVESTOCK SUPPLY CHAINS

LIVESTOCK PLAYS AN IMPORTANT ROLE IN A SUSTAINABLE FOOD FUTURE, BUT ADVANCES CANNOT AND WILL NOT HAPPEN IN SILOS.

BY SAMANTHA WERTH U.S. ROUNDTABLE FOR SUSTAINABLE BEEF

With the conclusion of Climate Week NYC at the end of September and preparations underway for the United Nations Climate Change Conference or Conference of the Parties of the UNFCCC (COP 29) in November, comes a renewed focus on the role of livestock in a sustainable food system.

Discussions around livestock production during Climate Week NYC, ranged from optimistic - livestock have a critical role to play in a sustainable food system and present a unique opportunity to offset anthropogenic (human-caused) emissions - to pessimistic livestock are the leading cause of climate change and we must do everything in our power to limit consumption and reduce livestock numbers immediately. With such conflicting points of view, often supported by confusing and contradictory information, it becomes increasingly difficult to understand what the role of livestock might be in either combating or causing climate change. Add to the equation corporate sustainability commitments and the increasing pressures to reduce scope 3 (i.e., downstream and upstream supply chain) emissions and the waters become increasingly muddied.

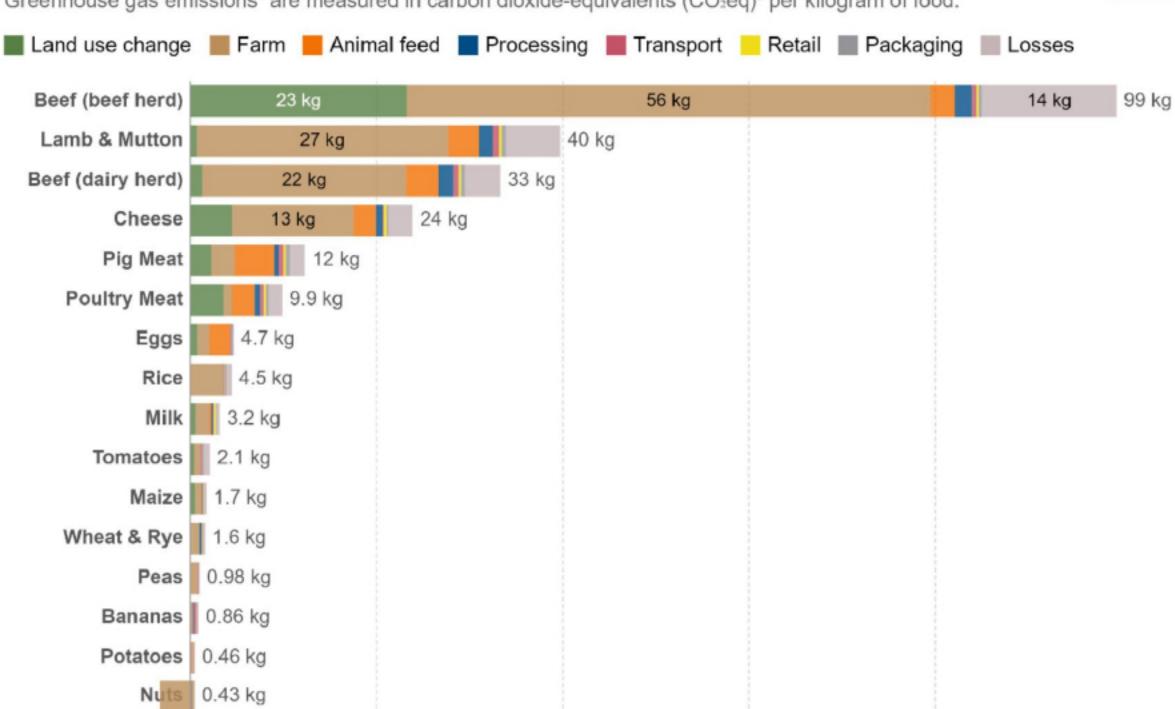
THE CURRENT STATE OF LIVESTOCK EMISSIONS

Globally, livestock production is responsible for approximately 7.4% of all GHG emissions while in the United States, livestock production is responsible for 4.3% of national GHG emissions, . In either instance, methane emissions, primarily from enteric fermentation from beef and dairy cattle, account for more than 70% of direct emissions from livestock production, or 5.2% of global and 3.0% of national GHG emissions. Taking emissions accounting a step further, when comparing livestock on an emissions intensity basis (i.e., kg of carbon dioxide equivalents per kg of product) animal sourced foods, especially beef and dairy products, rank highest compared to most other foods (Figure 1).

Figure 1. Average global emissions intensity of various foods for full supply chains (Source: Our World in Data, 2024).

Food: greenhouse gas emissions across the supply chain Greenhouse gas emissions¹ are measured in carbon dioxide-equivalents (CO₂eq)² per kilogram of food.





Source: Joseph Poore and Thomas Nemecek (2018).

OurWorldInData.org/environmental-impacts-of-food • CC BY

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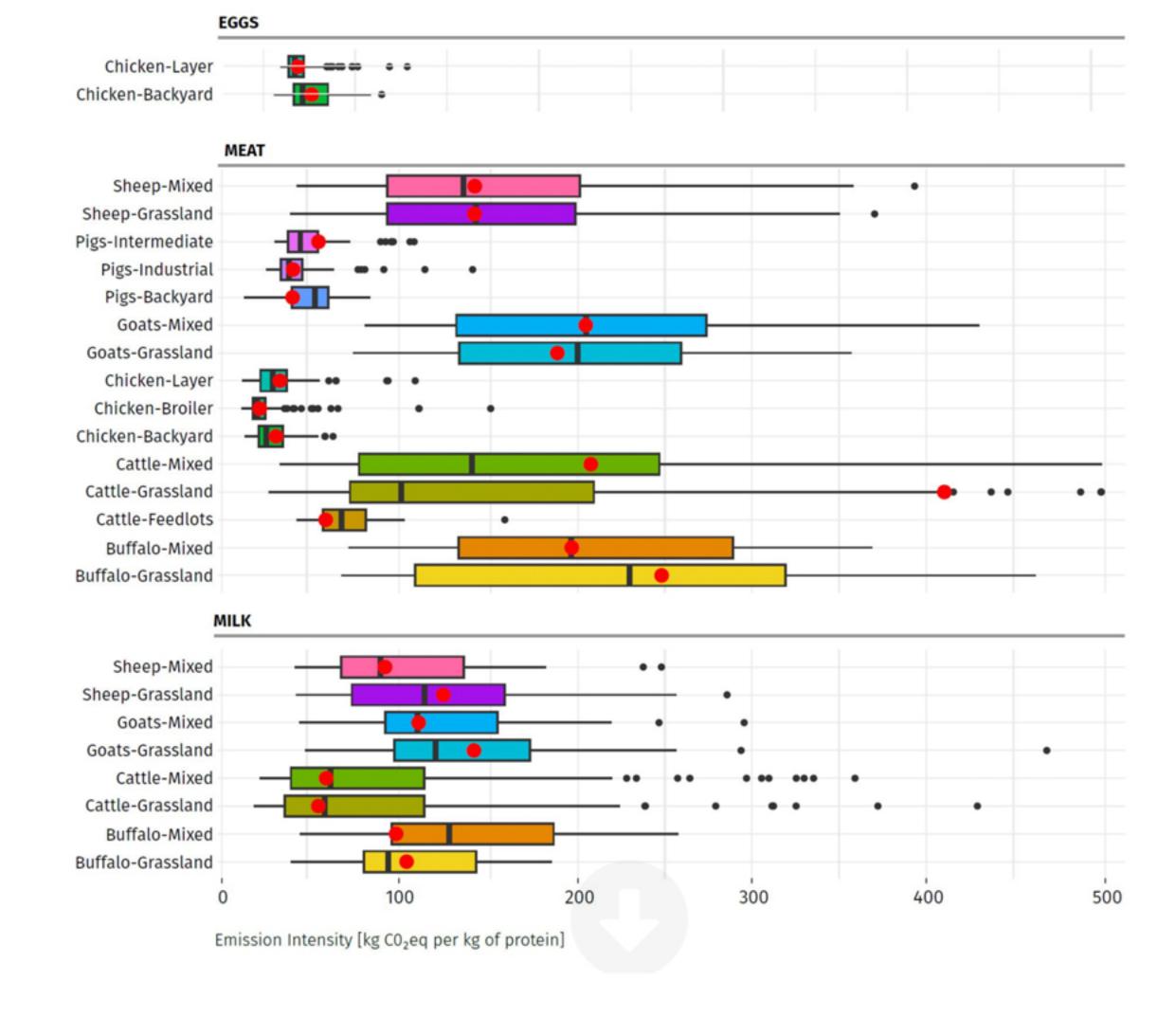
 Greenhouse gas emissions: A greenhouse gas (GHG) is a gas that causes the atmosphere to warm by absorbing and emitting radiant energy. Greenhouse gases absorb radiation that is radiated by Earth, preventing this heat from escaping to space. Carbon dioxide (CO₂) is the most well-known greenhouse gas, but there are others including methane, nitrous oxide, and in fact, water vapor. Human-made emissions of greenhouse gases from fossil fuels, industry, and agriculture are the leading cause of global climate change. Greenhouse gas emissions measure the total amount of all greenhouse gases that are emitted. These are often quantified in carbon dioxide-equivalents (CO2eq) which take account of the amount of warming that each molecule of different gases creates.

2. **Carbon dioxide-equivalents (CO₂eq)**: Carbon dioxide is the most important greenhouse gas, but not the only one. To capture all greenhouse gas emissions, researchers express them in 'carbon dioxide-equivalents' (CO2eq). This takes all greenhouse gases into account, not just CO2. To express all greenhouse gases in carbon dioxide-equivalents (CO2eq), each one is weighted by its global warming potential (GWP) value. GWP measures the amount

of warming a gas creates compared to CO2. CO2 is given a GWP value of one. If a gas had a GWP of 10 then one kilogram of that gas would generate ten times the warming effect as one kilogram of CO2. Carbon dioxide-equivalents are calculated for each gas by multiplying the mass of emissions of a specific greenhouse gas by its GWP factor. This warming can be stated over different timescales. To calculate CO2eq over 100 years, we'd multiply each gas by its GWP over a 100-year timescale (GWP100). Total greenhouse gas emissions - measured in CO₂eg - are then calculated by summing each gas' CO2eq value. Comparisons such as those depicted in Figure 1 are helpful in understanding general trends in emissions intensity of different foods

but are in reality an overgeneralization that does not provide appropriate context needed to fairly assess emissions from livestock. There exists a huge amount of variability in emissions intensity of animal sourced foods based on where and how animals are raised (Figure 2). For example, there can be as much as a 25 fold increase in the emissions intensity of beef from cattle raised solely on grasslands in a subsistence farming manner compared to cattle raised on grass and then finished in a conventional feedlot system, such as those we find in the U.S.

Figure 2. Global emissions intensity for different production systems, by species and commodity. The red dot depicts the global average, while the box represents where 50% of all regional emissions intensity numbers lie and the extending lines and black dots represent the range of emissions intensities, depending on region. (Source: FAO, 2023)



missing. While livestock constitutes a relatively small percentage of global and national emissions, the higher emissions intensity of animal-sourced foods makes livestock an easy target in climate conversations. The argument is that a shift in consumption away from animal-sourced foods will lead to a substantial reduction in GHG emissions thereby helping to combat the effects of climate change. On the other side of this argument, there is a unique opportunity to leverage livestock production to combat climate change.

Even in a comparison such as this, key contextual components, such as livestock's total contribution to global emissions, are still

Methane is by in large the most significant emission resulting from livestock production and thus reductions in methane emissions from livestock provide an opportunity for greater reductions in overall livestock emissions. There are a number of opportunities in which methane can be reduced from livestock production, predominantly with a focus on

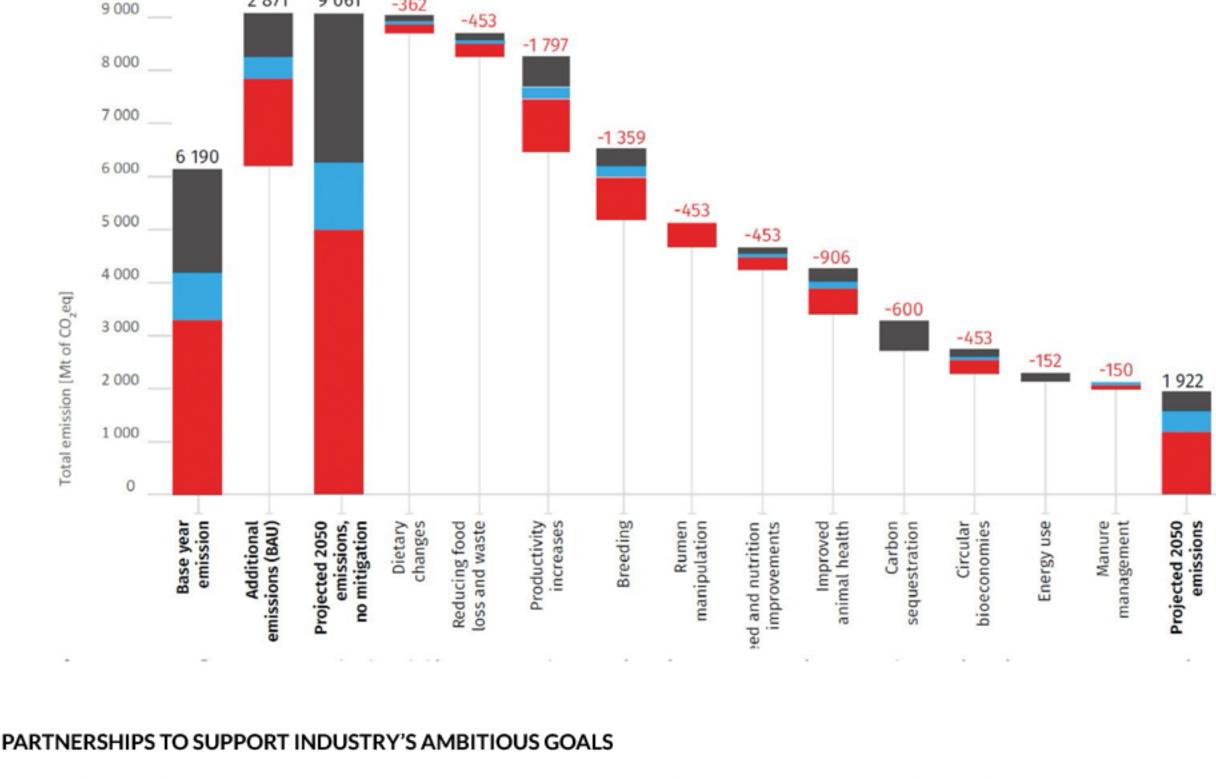
beef and dairy supply chains. In a report published by the FAO during last year's COP, productivity increases, breeding, improved animal health and rumen manipulation were listed at the greatest opportunities for reducing emissions from livestock (Figure 3).

emissions if reductions are achieved (Source: FAO, 2023).

CH₄

CO₂

Figure 3. Current global livestock emissions, projected emissions assuming a business as usual case scenario (BAU), opportunities for emissions reductions and projected



While there exist ample opportunities to reduce emissions from livestock, there are two key points to note: (1) reduction opportunities are large within the livestock sector but remain a relatively small piece of the global emissions pie and (2) emissions

9 061

2 871

10 000

reduction opportunities will vary depending on production systems and location. Regardless of livestock's relatively low contribution to global and national emissions compared to other sectors, livestock supply chains around the world recognize the role that livestock can play in supporting emissions reductions and there are several key

Multi-stakeholder organizations, such as the U.S. Roundtable for Sustainable Beef (USRSB), Canadian Roundtable for Sustainable Beef (CRSB), Global Roundtable for Sustainable Beef (GRSB), U.S. Roundtable for Sustainable Poultry and Eggs (USRPE), Innovation

multi-stakeholder organizations and partnerships working to support continuous improvement across livestock supply chains.

Center for U.S. Dairy and Global Dairy Platform (GDP) work across their respective supply chains, from producers to retail and foodservice companies, to understand unique challenges and support activities that lead viable solutions to identified challenges. Several of these organizations have set ambitious, aspirational goals around climate intended to propel action across their respective supply chains. In 2022, USRSB has set a goal for the U.S. beef supply chain to achieve climate neutrality by 2040.

Similarly, CRSB has set a goal to reduce primary production GHG emission intensity by 33% by 2030 and GRSB has set a goal to globally reduce the net global warming impact of each unit of beef by 30% by 2030, on a pathway to climate neutrality. In 2021, GDP launched their pathway to diary net zero initiative which is dedicated to reducing GHG emissions from dairy over the next 30 years.

Perhaps more important even than the goals set by these organizations is the actual work being done across these organizations to support advances across their respective supply chains. As an example, USRSB has recently partnered with the Foundation for Food & Agriculture Research (FFAR) to develop a U.S. Beef Sustainability Research Roadmap. To date, USRSB and FFAR have hosted three virtual sessions in which academic experts have presented the current state of the science, research gaps and potential opportunities related to USRSB's air, land and water goals. Later this month, USRSB and FFAR will build upon these virtual

sessions and host an in-person workshop where experts from across academia and the U.S. and global beef supply chains will convene to further identify research opportunities and support development of a targeted research roadmap for U.S. beef. Efforts like this from USRSB along with the many other activities happening at CRSB, GRSB, GDP and others are critical to ensuring effective and place-based solutions are developed to support advancement of our livestock supply chains and corresponding reductions to emissions from livestock. Without coordinated and collaborative efforts across our livestock supply chains we will not

achieve the type of change being called for at events like Climate Week NYC. Livestock has an important role to play in a sustainable food future, but advances cannot and will not happen in silos. As the famous

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Samantha Werth, PhD, is executive director, U.S. Roundtable for Sustainable Beef. Opening image credit: To come

African proverb states, "If you want to go fast, go alone. If you want to go far, go together."



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ANIMAL AGRICULTURE EXPERTS AND STAKEHOLDERS NEED COLLABORATIVE EFFORTS TO EXPLORE, DISCUSS, LEARN AND DEVELOP KNOWLEDGE THAT FOSTERS INTERDISCIPLINARY COOPERATION FOR THE IMPROVEMENT OF ANIMAL AGRICULTURE.

BY MORGAN J. YOUNG

In the animal agriculture world, 2024 may be known as the year of H5N1. Traditionally known as Highly Pathogenic Avian Influenza (HPAI), the virus is a contagious disease of birds posing a major threat to the poultry industry. The H5N1 strain of this disease is devastatingly deadly and can wipe out entire flocks of poultry in a matter of days. 1

H5N1 is not new to the animal kingdom. The first H5N1 outbreak was identified in the U.S. as early as the 1920s.2 By the 1980s, the virus had experienced multiple evolutions and was seen in domestic and wild birds and was implicated to impact human health.3 Fast forward to 2022 and H5N1 was detected in various non-agriculture mammals. In March 2024, the first case of H5N1 is detected in infant goats on a farm where the backyard flock had also tested positive. Days later, H5N1 was reported in cows in Kansas and Texas dairies. By April, the first cow-to-human transmission was reported in the U.S.4

H5N1 has a mortality rate of nearly 100 percent in poultry flocks, and often leads to millions of birds culled to contain the outbreak, resulting in massive economic impacts. In 2015, the U.S. suffered \$3 billion in economic losses.5

In April 2024, The National Institute for Animal Agriculture (NIAA) was preparing for Annual Conference – an annual convening of animal agriculture professionals. The concern of the zoonotic disease grew more quickly than the virus due to its unknown impacts and scale. NIAA added a roundtable discussion that consisted of a consulting dairy veterinarian in Texas, the state veterinarian from Kansas, and a veterinarian from the Centers for Disease Control and Prevention. With representation from multiple species and sectors of the animal agriculture value chain in attendance, the roundtable discussed the new infections, how they were being researched and what information had been learned to date.

In the early days of the outbreak, little was known about transmission to humans through an infected cow's milk. Researchers and species associations were quick with responses to the public health concerns to ensure safety. The fear that the virus would or could spread into beef cattle or swine is still very real today. Swine production has some of the most rigorous biosecurity measures among animal agriculture, but there is still risk.

One takeaway from the roundtable discussion at Annual Conference was that experts had been working in proverbial silos and were now struggling to address the zoonotic disease across the barnyard and in human health. The state veterinarian may not know who to contact in the state health department to collaborate and share information. Some dairy experts did not know who to contact in the poultry sector to learn from past experiences. Since animal movement quickly became a concern, connecting animal and human health professionals across state lines became a priority.

After Annual Conference, NIAA leaders identified an opportunity to ensure various individuals and organizations could leverage each other's insights and expertise. NIAA was asked to convene a virtual "meet and greet" to ensure animal agriculture was holistically addressing H5N1 – a task that can be nearly impossible if species and health officials don't know how to reach across the industry for information or assistance. NIAA connected leaders from more than 40 national associations and governmental agencies in the animal agriculture sector. These new collaborations led to shared insights and protocols to address biosecurity, worker health and safety, food safety, animal care, and more.

In July, The National Pork Board (NPB) partnered with NIAA to convene a group of public health, animal health and swine professionals to build relationships, provide an open forum for dialogue, and explore opportunities for One Health6 collaborations.

At the end of August, NIAA hosted a reversal of the previous farm tour experience with a meeting in Atlanta at the CDC campus with animal agriculture leaders across species sectors. This meeting supported CDC delegates at the World AMR Congress and the UN General Assembly discussion on antimicrobial resistance as they provide informed One Health testimony including perspectives and practical applications from experts and professionals in the animal agriculture sector.

When animal agriculture is faced with a new disease affecting animal health or issue facing the animal agriculture industry, NIAA works to connect leaders for broader consensus and information. NIAA was founded in 1916 to address the problems and opportunities of controlling and eradicating livestock diseases and improving livestock handling procedures. In more than 100 years, NIAA has seen dozens of diseases affecting animal agriculture and has celebrated the eradication of several. The mission today is to convene animal agriculture experts and allies in collaborative settings to explore, discuss, learn, and develop knowledge that fosters interdisciplinary cooperation for the improvement and continuous progress of animal agriculture. While 2024 may be remembered as the H5N1 year in animal agriculture, NIAA will remember it as a year we were able to coalesce leaders for the advancement of animal agriculture.

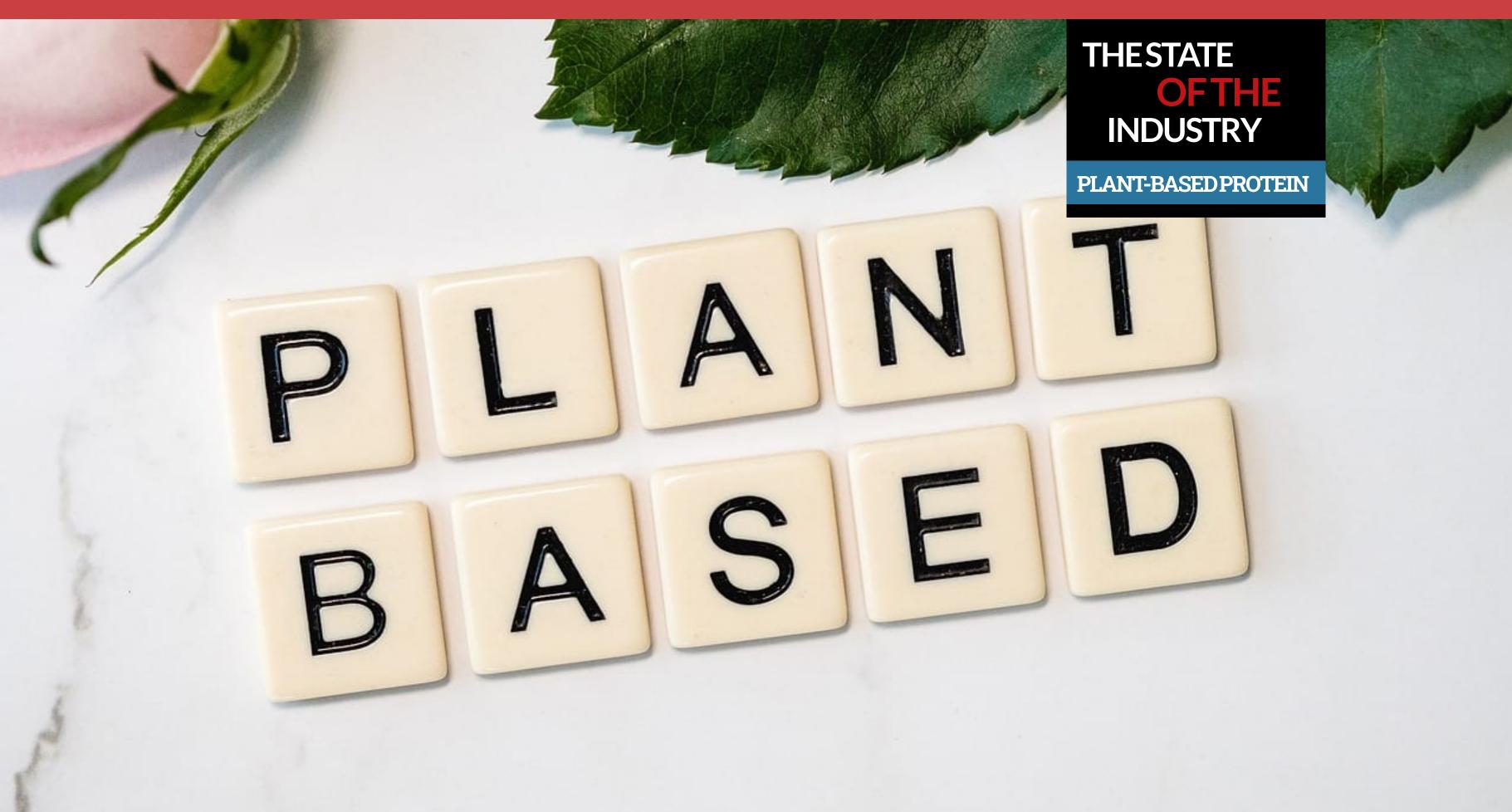
Morgan J. Young is director of communications and outreach with National Institute for Animal Agriculture.

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Photo credit: Getty Images / taxzi







EVOLUTION OF PLANT-BASED PROTEIN

BY TO COME

Despite the surge in popularity for plant-based protein nearly a decade ago, consumers soon realized that their plant-based "meat" was not cutting it, citing disappointing flavors, textures and mouthfeels as majority category downfalls. Now, consumers remain open to buying plant-based protein, but they demand taste and texture improvements.

As consumers are increasingly concerned with sustainability initiatives, animal welfare and health and wellness, the plant-based protein category still has clear potential, offering a surefire way to meet persisting consumer demands and priorities. To get the scoop on the latest plant-based category trends, The National Provisioner spoke with Before the Butcher President and Founder Danny O'Malley.

HOW IS PLANT-BASED CATEGORY ADDRESSING TASTE AND TEXTURE CONCERNS WHILE KEEPING UP WITH CONSUMER DEMAND?

Over the years there's been an evolution of these products, starting back seven-plus years ago when Beyond and Impossible released their plant-based burgers. That was really the start of this evolution and the opportunity for companies like mine and others out there that are trying to create the best product that mimics animal-based protein in such a way that people recognize it and accept it. And they need to be delicious. So, the texture, the taste, the look of it is all really important.

And if you look at some of the products that were developed six or seven years ago, many of those products aren't on the market anymore because the products have changed over time and companies are getting better and better at making products that are really, really similar to animal-based proteins.

Now the meat category, I believe has been the one that has done the best job ... and we're starting to see seafood hit the market pretty strong right now. It's got a little ways to go, but we're going to continue to see that, as these companies go in and develop products that are getting better and better. We're seeing whole-meat cuts right now, steak, chicken fillets and things like that that are actually quite good.

PLANT-BASED MEATS TYPICALLY COME WITH A HIGHER PRICE POINT. HOW ARE CONSUMERS MARRYING INFLATIONARY PRESSURE WITH THE DESIRE FOR PLANT-BASED PROTEIN?

It's a challenge. And I think we're all feeling it right now. We're certainly seeing that. As a value-added product, you're looking at people making a decision as to what they can put on the plate and what they want to put on the plate. And sometimes that's different, and so they have to make a choice and say look, instead of buying these products once a week or twice a week, now we might have to do it every other week until we feel settled in.

The prices of everything are higher, and certainly wages haven't matched that. So it is a challenge for the average consumer, whether they're meat eaters or they're flexitarians or meat reducers, vegans or vegetarians. We're all making decisions, whether it has to do with regular animal-based protein. Maybe you're not buying the grass-fed beef anymore—it's the same thing with plant based ... But most of the products that are plant-based products are a little bit higher than the animal-based proteins that they're mimicking.

AS YOUNGER CONSUMERS ARE GAINING MORE SPENDING POWER IN THE MARKETPLACE, ARE YOU SEEING MORE OF A TRANSITION TO PLANT-BASED PROTEIN?

There's a natural progression toward plant-based. And that's because the generations that we're seeing now like Alpha Gen, even the tail-end of the Millenials, and also the Z gen. They've been kind of brought up on this. ... They know all about plant-based. The education is different today. Ten years ago when I was working in the industry, 90% of my time was trying to educate people, trying to get them to understand what this is all about. We don't have to do that anymore. Now they just want to try to the products. They want to see what it's like, they want to taste it. They want to understand what the differences are between one product and another. But we don't have to tell them what we're doing and why we're doing it. They get it.

Yes, the money is a big part of it—when you've got money in your pocket you can go out and buy everything you want. But the education process of what we're doing and why we're doing it has evolved to the point where we don't have to talk about it much anymore. So the kids nowaways, the Alpha, the Z generations, they're brought up with this. This is what they know, and they're going to go out and purchase it because they understand it already.

Are you seeing any flavor/formulation trends that are particularly popular or driving the category right now?

There is no question ... Ethnic-type foods. Hispanic, Asian, Indian. Flavorful products are now being more introduced. And when you go online and you start looking at some of the chefs out there that are showing off plant-based products. They're talking about this as well. They're saying, 'Hey, look, the great thing about many of the products that are made today is they're kind of a blank slate.' If you get a ground, a plant-based ground or crumble ... It's just like ground beef. You're going to do something with it. Chicken, there's a lot of just plain chicken chunks and strips. You're not likely to eat it like that—you're going to do something with that. So ethnic type of recipes and flavor profiles are really starting to explode on the plant-based side of the business today, no doubt about it.

HOW CAN RETAILERS AND PRODUCERS ALIKE DRIVE PLANT-BASED PROTEIN CONSUMPTION? IS THERE ANYTHING THAT THEY CAN DO TO INCREASE VISIBILITY TO THE CATEGORY?

The retailers just have to make it more accessible and more reasonable for suppliers to go out there and put their products on the shelf and get it in front of the consumer. The manufacturers, the companies that are making these products, probably have to do a little bit better job of getting out there either on social media or even general media and making sure people understand the options that are available. But the retailers really need to step forward again. They did a really good job a few years ago of stepping forward and opening up space for the plant-based products on their shelves. They've squeezed those spaces again. And we all know what's happened with inflation and the challenges across the board with retail. But they're got to reopen it and make a full commitment to this and just keep this space available for plant based. And then I think we're going to see more products hit the market that are really exciting and fun to see out there for everybody to try.

Photo credit: Fuzzy Rescue from Pixabay





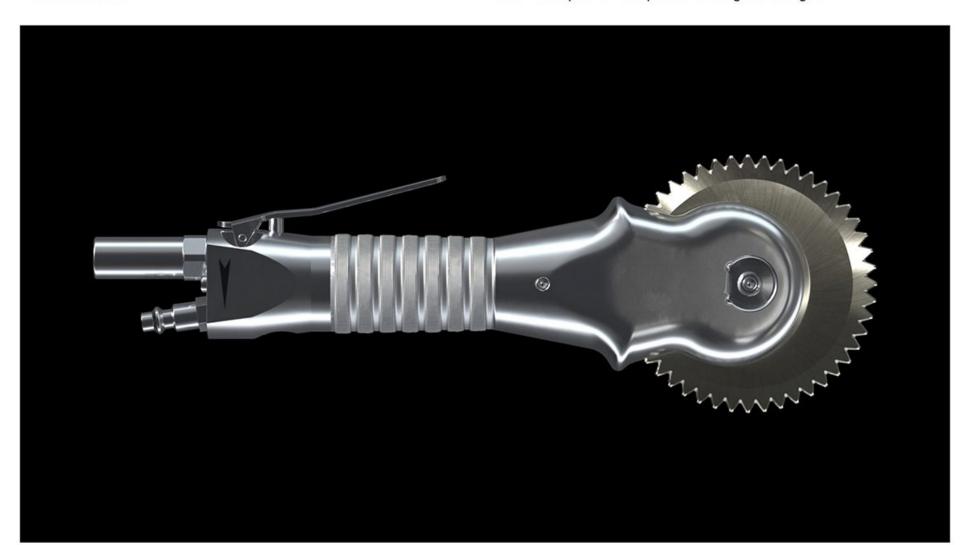


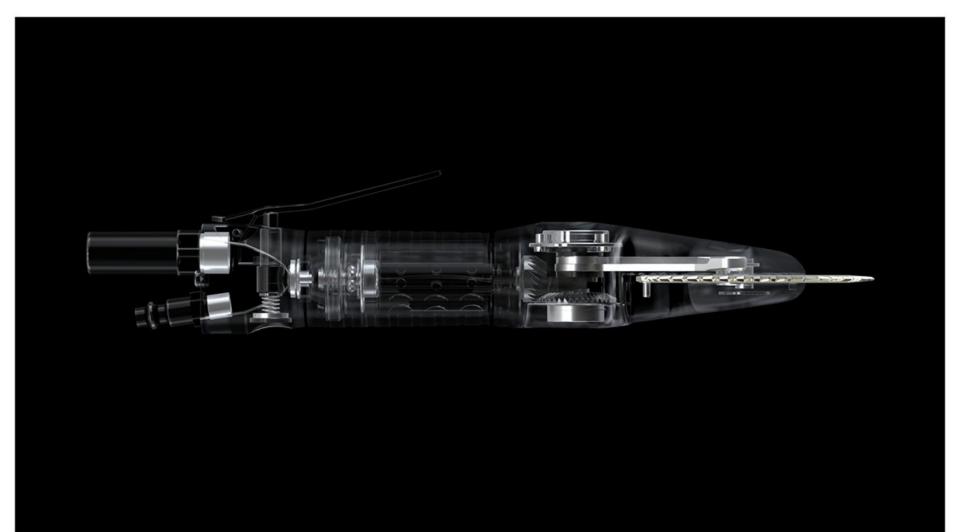






« ВАСК









IMPROVING ANIMAL HEALTH AND WELFARE POSITIVELY AFFECT PRODUCTIVITY AND ECONOMIC SUSTAINABILITY.

Climate change and shifts in consumer behavior continue to impact the meat industry. In fact, in 2023, the U.S. reported the smallest beef cow inventory in the last 50 years, according to the National Cattlemen's Beef Association. Meanwhile, consumers are increasingly concerned about how animals are treated in the food industry, with nearly 70% of Americans saying that animal wellness plays an important role in purchasing decisions. This shift toward ethical consumerism is driving demand for consistency and compliance among meat producers and processors. Retail and restaurant brands are also setting higher animal welfare standards for producers of animal origin for marketability and public credibility.



BY DR. ELAINE VANIERNSF

Animal wellness is complex and multifaceted, involving scientific, ethical, economic, cultural, social and political factors. The meat industry must address animal wellness by making informed, animal-centric decisions and factoring in environmental, social and governance (ESG) considerations.

MEETING SUSTAINABLE DEVELOPMENT GOALS

The industrialization of animal farming and the growth of concentrated animal feeding operations (CAFOs) have led to adverse impacts on the planet's air and water quality. According to the US Environmental Protection Agency, agriculture contributes at least 11% of the nation's greenhouse gas emissions.

The United Nations Sustainable Development Goals (SDGs) are the heart of the 2030 Agenda for Sustainable Development, which was adopted by all UN member states in 2015. The SDGs provide an urgent call to action across countries to end poverty, improve health and education, reduce inequality and spur economic growth.

As a leading consumer of land and water, animal agriculture can contribute to biodiversity loss and climate change. The relationship between animal welfare and sustainability goes well beyond environmental conservation, involving ethical, economic and social factors. As such, several of the SDGs apply to animal welfare, including SDG 2 (zero hunger), SDG 3 (good health and well-being), SDG 6 (clean water and sanitation), SDG 8 (decent work and environmental growth), SDG 12 (responsible consumption and production) and SDG 15 (life on land).

Animal wellness will continue to play a key role in achieving the SDGs as direct measures that improve animal health and welfare positively impact productivity and economic sustainability. The meat industry has already begun reviewing and considering the SDGs from both human and animal perspectives and aligning their ESG goals accordingly.

ADVANCING TOWARD ONE HEALTH

At NSF, we often refer to the "One Health" concept, which says animal health, human health and environmental health are intrinsically intertwined and interdependent. The health of one affects the health of all and implementing animal wellness will improve animal health and productivity while reducing reliance on antimicrobials. As a result, antimicrobials can be used more selectively, reducing associated costs.

Increasingly, farmers are using new ways of reducing environmental impacts, including attaining certification to standards that both improve animal health and productivity while reducing the carbon footprint.

These sustainable applications can alleviate the demand on our protein supply chains while supporting the UN SDGs, driving viable means of feeding the world's population while replenishing our planet's natural resources and reducing emissions.

MONITORING REGULATIONS AND INDUSTRY CHANGES

Stronger environmental regulations will continue to change the trajectory of industrialized farming, as will demand from consumers and retailers. The regulatory framework that governs animal welfare in the U.S. is multifaceted, involving federal laws, state statutes and specific regulations for various sectors.

For example, in California, Proposition 12 (Prop 12) certification is now required for all American meat and egg distributors distributing products in the state. The law, which went into effect Jan. 1, 2024, ensures compliance with the state's animal welfare standards.

Several industry organizations are working to advance animal wellness across the nation, including the Meat Institute, which is comprised of more than 350 packers, processors, suppliers and allies. The institute has set a target for 100% of its members to deliver greenhouse gas reduction targets approved by the Science-Based Targets Initiative (SBTi) by 2030. It has launched a greenhouse gas inventory tool under the Meat Institute Protein PACT, a reporting initiative to enable supply chain collaboration to advance the People, Animals and Climate of Tomorrow.

Meanwhile, the U.S. Roundtable for Sustainable Poultry & Eggs (US-RSPE) Sustainability Framework is the first-ever multistakeholder sustainability framework developed for the full U.S. supply chains for chicken, turkey and eggs from producer to final customer. The framework provides a voluntary assessment to collect and analyze sustainability data, consisting of 101 metrics across 15 areas of importance. The US-RSPE focuses on four priority areas in sustainability: energy and greenhouse gas conservation, air quality, land use and water use and quality.

The meat industry must continue to monitor for new and updated regulations and tools, ensuring that requirements are met and the proper food safety and sustainability practices are in place.

WORKING BETTER TOGETHER

It is essential for industry members to work closely with independent, third-party organizations, especially when leveraging audits and certifications to validate animal welfare practices.

At NSF, we see best practices in action via Raised Without Antibiotics, the only independent certification mark that assures consumers animal products were produced without exposure to antibiotics, and the Global Animal Wellness Standards, a comprehensive framework that ensures wellness for the entire lifespan of animals throughout the protein supply chain. The Global Animal Wellness Standards are designed to address every step in the life cycle of all key animal agriculture species, ensuring that a strong, consistent animal wellness system is in place.

NSF also certifies to the GLOBALG.A.P. standard, which includes a protocol called the Sustainable Program for Irrigation and Groundwater Use (SPRING), a key tool that reduces the environmental impact of irrigation practices, reducing the risk of crop failures due to droughts and other natural disasters.

By recognizing the interconnectedness of farm animal welfare with broader sustainability goals, together, we can work toward building a more resilient, ethical food supply chain.

Dr. Elaine Vanier is Technical Scheme Lead, Animal Wellness, for NSF. In her role, she is responsible for the coordination of animal wellness and animal feed programs, providing technical expertise and support for the development and global delivery of audit programs, certification, training and consultation services.

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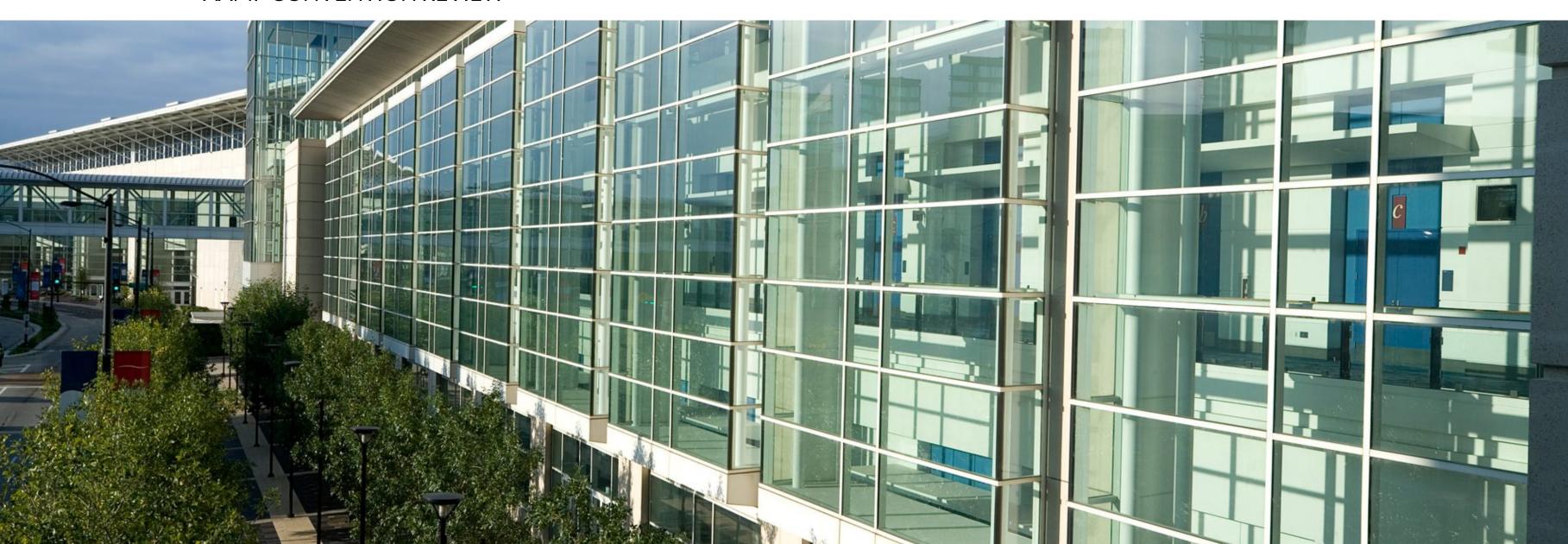
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PACK EXPO INTERNATIONAL OFFERS NEW, EXPANDED SHOW FEATURES

THE 2024 SHOW IS SET FOR NOV. 8-12 AT MCCORMICK PLACE IN CHICAGO

Pack Expo International is quickly approaching, with the show set for Nov. 8—12 at McCormick Place in Chicago. Featuring 2,600 exhibitors and over 150 free educational sessions, this year's Pack Expo International will unite more than 45,000 packaging and processing professionals from across over 40 vertical markets. Attendees from across the globe will come together to connect, learn and discover innovative products and solutions.

NEW, EXPANDED FEATURES

This year, the show is offering new features including Sustainability Central, Emerging Brands Central and an expanded Logistics Pavilion.

- Sustainability Central: Taking a look into packaging sustainability and what it means to brands, including expert speakers at the Sustainability Stage, and a look at sustainable solutions in manufacturing, materials, recovery, logistics, analytics and design.
- Emerging Brands Central: An evolution of the Emerging Brands Summit, this resource for rising brands seeking to expand their reach and scale operations. The educational stage offers access to industry experts sharing insights on topics such as product development, packaging innovation and scaling strategies. Show attendees are welcome to participate in these 30-minute sessions.
- Logistics is a crucial part of the product journey from manufacturer to consumer. As a result of high demand from attendees, the 2024 Logistics Pavilion will be four times larger than 2022. The pavilion offers targeted solutions related to the supply chain, including distribution, warehousing, transportation, material handling, docking, and inventory management.

RETURNING PAVILIONS

In addition to new and expanded show features, Pack Expo International will be bringing back the Processing Zone, Containers and Materials Pavilion, PACKage Printing Pavilion, Reusable Packaging Pavilion, Association Partner Pavilion, Workforce Pavilion and more to streamline the attendee experience.

On the show floor, attendees can visit over 150 free educational sessions, all covering fresh topics and trends in packaging and processing.

- Three Innovation Stages will offer 30-minute seminars on new technologies and techniques for various industry solutions.
- The Processing Innovation Stage will focus on the latest food processing breakthroughs.
- Attendees can visit Industry Speaks to hear the PACK EXPO International Partner Program address hot topics and industry trends.
- The Reusable Packaging Learning Center, sponsored by the Reusable Packaging Association, will teach attendees how a reusable packaging system can benefit operations, create economic values and lower environmental supply chain impact.





STUDENT OPPORTUNITIES

Students attending Pack Expo International have the opportunity to take advantage of opportunities for education, connection and growth. PACK Challenge will bring together six high-school teams in a machine-building competition. The teams include Argo Community High School, Crete Monee High School, Elk Grove High School, Legacy Academy/Becker High School Coalition, Rich Township High School and Waterford Union High School. The Amazing Packaging Race, sponsored by Emerson, features college students racing to complete tasks at participating show booths.

Students can connect further at the Student Lounge, which will feature PMMI human resource professionals offering interview best practices and resume writing insights for students. On Nov. 5, Indiana, Illinois and Wisconsin students can participate in PACK the EXPO, featuring tours, a scavenger hunt and lunch-and-learn session.

CONNECTION AND CELEBRATION

While at the show, industry professionals can attend take advantage of multiple networking opportunities. PACK gives BACK, sponsored by Rockwell Automation, is the show's annual benefit, this year featuring a performance by comedian Nate Bargatze. Attendees can connect and network at the Packaging & Processing Women's Leadership Network breakfast, featuring sponsors BW Packaging, Emerson, ID Technology, Morrison Container Handling Solutions, Plexpack Corp. and Septimatech. Sponored by Beckhoff Automation LLC, the Young Professionals Network will host an evening event for young professionals.

The show will also feature two awards program: Technology Excellence Awards and the Packaging & Processing Hall of Fame. The Technology Excellence Awards recognize top innovation technology not shown at a previous Pack Expo show. The hall of fame will be inducting its 48th class, honoring four new members. Since being established in 1971, the Packaging & Processing Hall of Fame has recognized industry professionals for their industry contributions and education.

Show registration is available at packexpointernational.com.

Source: PMMI, The Association for Packaging and Processing Technologies

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FORTRESS TECHNOLOGY

Pack Expo 2024 will be a landmark event for Fortress Technology as they unveil their newest system - the ICON X-ray, their most advanced inspection system.

Located at Booth S-1758, visitors can experience the ICON X-ray, a high-spec solution designed for exceptional detection capabilities. It features internal view cameras, integrated reject devices and advanced IA+ algorithms for superior processing of variable-density products. Networked data capture and reporting enhance traceability, making it adaptable for future machine learning.

The ICON X-ray optimizes floor space while delivering precise inspection for complex applications, setting a new standard in food safety. It's ideal for processors seeking a solution that combines detection power with advanced data integration.

"Pack Expo is the perfect stage to demonstrate the ICON X-ray," says Steve Gidman, Founder and President of Fortress Technology. "This system represents a significant leap forward in food safety and quality control."

Alongside the ICON X-ray, Fortress will showcase 16 inspection systems, including the new Raptor BBK metal detection and checkweighing combination system. Each system is designed to meet the evolving needs of food processors, enhancing productivity, safety, and efficiency.

Don't miss the chance to see the ICON X-ray and explore how Fortress Technology is redefining food safety at Pack Expo 2024



OSSID

Ossid is set to impress protein processors at PACK EXPO 2024 with an all-star lineup of cutting-edge packaging solutions. Visit booth S-3530 to see how Ossid can help enhance your operations with efficient and sustainable packaging technologies. As a leader in tray packaging, thermoforming, and weigh price labeling, Ossid brings a variety of machines designed to streamline your production while maintaining high standards of quality.

Leading the booth showcase is the Reepack ReeForm Series Thermoformer, a flexible solution built to handle a wide range of packaging styles, from modified atmosphere to vacuum skin packaging. Its stainless steel frame ensures sanitation in washdown environments, while electric processing stations offer energy efficiency and low maintenance.

Also featured is the Reepack ReeMaster Series Automatic Tray Sealer, perfect for medium to large processors. With speeds up to 45 cycles per minute, this tray sealer is ideal for sealing and lidding trays, cups, and rounds, including vacuum skin pack applications.

For high-speed overwrapping, the 500Si Stretch Overwrapper is another showstopper. Capable of wrapping up to 120 trays per minute, this machine's servo-driven technology minimizes downtime, and its ecofriendly design is ideal for processors looking to reduce their environmental footprint.

Attendees will also see the 500Si in action, integrated with the Ossid NextGen 2115 Weigh Price Labeler, a redesigned system capable of labeling up to 180 packages per minute, making it a top choice for fast-paced production environments.

From the ReeTray 30 Semi-Automatic Tray Sealer to the NextGen WPL, Ossid's comprehensive lineup has the right solution for protein processors. Stop by booth S-3530 to explore Ossid's full range of packaging solutions, designed to improve efficiency, enhance product safety, and meet sustainability goals.







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VDG is the world's leader in the design and manufacturing of drum motors, with a strong focus on safety, reliability, and longevity. Manufacturing inhouse in the USA and Canada for 39 years, using cutting-edge production technology and automation, VDG ensures product quality, short lead times, and after-sales service.

For food processing and handling belt conveyor applications,VDG's all-stainless steel SSV Series Drum Motor is designed for 80,000 hours of continuous operation without maintenance. It features a premium-efficiency electric motor and an IP69K sealing system that withstands pressure washdown up to 3,000 psi.

SSV Drum Motors drive modular conveyor belts without using sprockets, eliminating crevices that trap by-products and bacterial harborage, reducing washdown time and water usage by 50%.

See the unique display showcasing the new generation of SSV Series Drum Motors, including the new SSV-XP, as well as the unique VDG CrossDrive® with IronGrip™ Lagging at Pack Expo Booth N-4950.

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THE SURGE IN USDA PUBLIC HEALTH ALERTS:

ANEW FOCUS IN FOOD SAFETY

WHILE ONLY FOUR PUBLIC HEALTH ALERTS WERE ISSUED IN 2019, 2023 SAW A JUMP TO 24.

BY SHAWN K. STEVENS

FOOD INDUSTRY COUNSEL LLC

For the last 15 years, I have closely tracked trends and data related to food product recalls, aiming to understand the causes behind these crucial safety measures. In 2021, we took this effort further by launching the Food Recall Reporter, a comprehensive database that catalogs all major food, beverage, pet food, animal feed, and dietary supplement recalls from 2000 onward. Each year, I summarize these findings to highlight the driving forces behind recalls, especially those related to USDA-regulated products.

Historically, USDA food product recalls have significantly declined. For instance, there were 132 recalls in 2017, but that number dropped to just 31 by 2020, signaling a considerable improvement in food safety management within the meat industry. However, despite this success, there is a rising food safety trend that warrants attention: the growing use of USDA Public Health Alerts.

Unlike recalls, Public Health Alerts act as a rapid-response mechanism, allowing USDA to inform the public of potential risks when formal recall conditions aren't met – or, when a company refuses to voluntarily recall an offending product. These alerts can be issued when a food product is suspected to be hazardous, even if no illness or injury has been definitively linked to it. In addition to coming into play when companies resist recalling products, we have also observed them being used when a product is no longer available on shelves, but may still pose a threat to consumers with leftover items in their homes.

The overall numbers tell a compelling story. While only four Public Health Alerts were issued in 2019, 2023 saw a jump to 24, covering issues ranging from pathogens to foreign materials and undeclared allergens. So far this year, there have been a total of food product 39 recalls, and USDA has issued a total of 14 Public Health Alerts. Given the increasing use by USDA of this new regulatory and public health tool, and statements from the agency that USDA finds the tool to be quite effective, we anticipate that the agency will continue to use Public Health Alerts more frequently.

Moving forward, it's clear that Public Health Alerts will play an increasingly vital role in influencing industry's recall decision making process, and, from the agency's perspective, protecting consumers. While the existence of food recalls will remain a key measure to protect consumers from potential adverse health consequences when suspect product is in the market, the growing use of this tool demonstrates that food safety regulatory and recall landscape continues to evolve.

So, be sure to inform your company's leadership about this new and emerging public notification factor in food safety. Even if a food safety issue does not rise to the level of, or would otherwise mandate, a voluntary recall announced by your company, USDA may nevertheless, without your permission, issue a Public Health Alert if the agency believes that something is wrong. Thus, be sure to update your crisis management strategies to ensure that, if USDA publishes an alert naming your company, you are well positioned, from a PR standpoint, to adequately respond.

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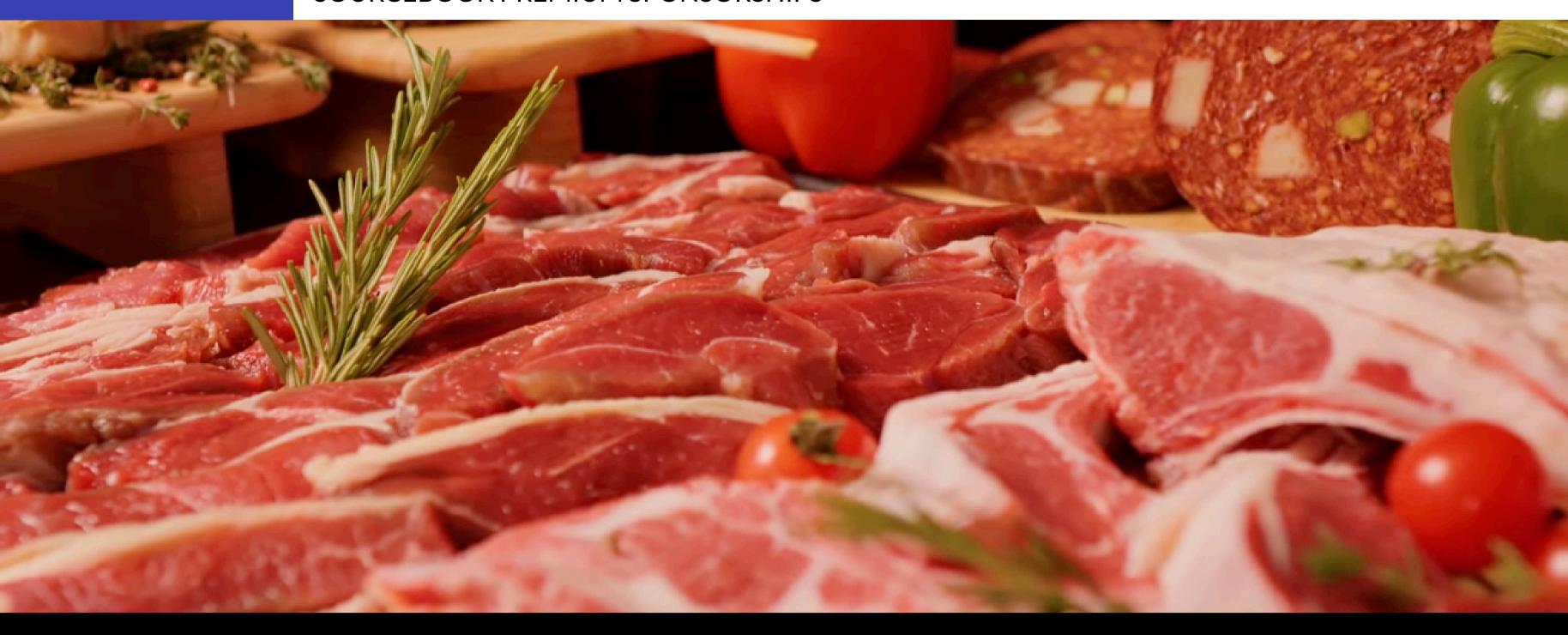


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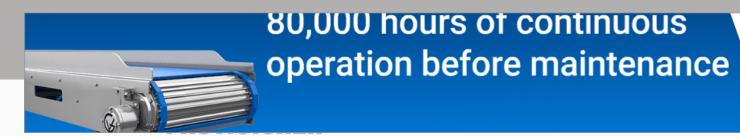
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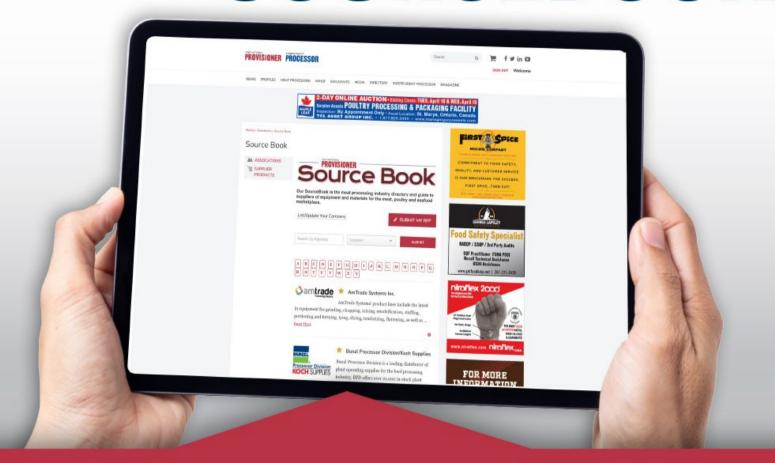
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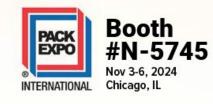




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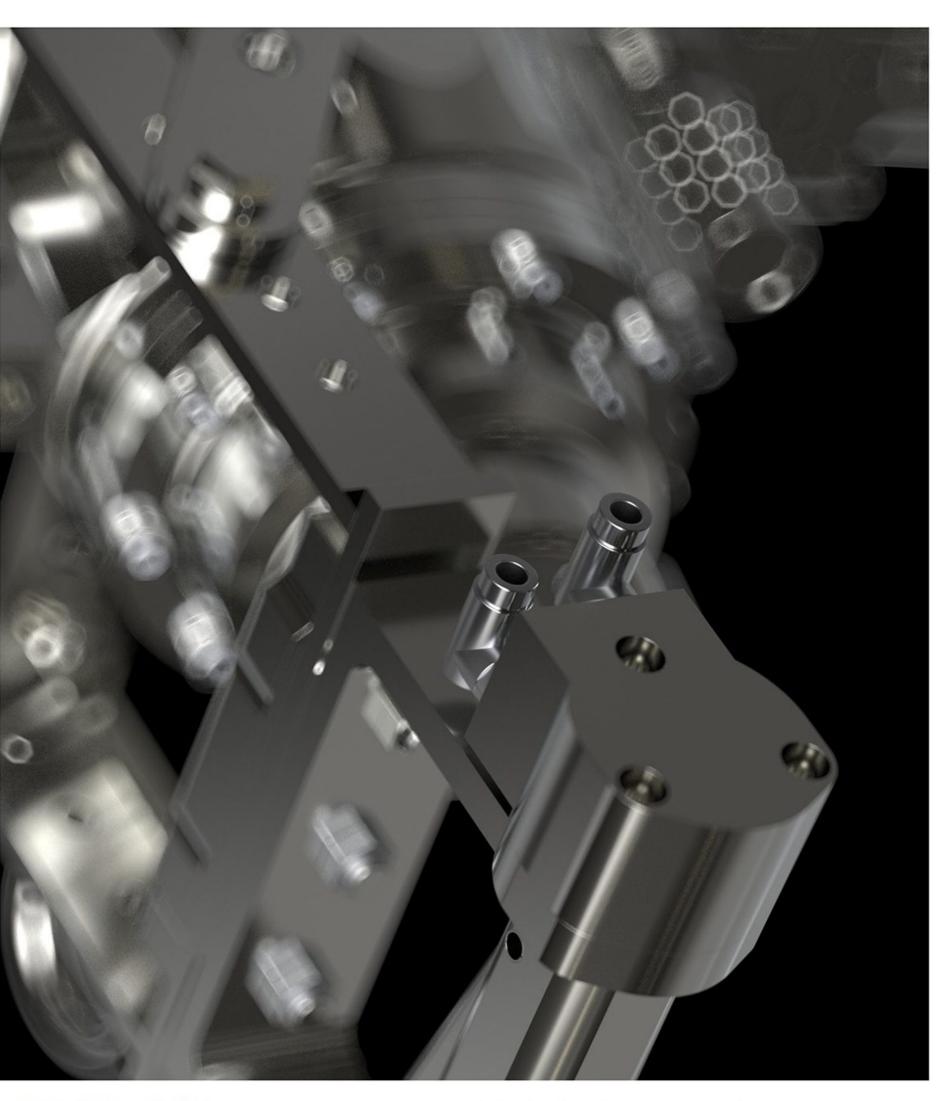






NEXT ≫









PROMOTIONAL EFFORTS PLAY UP LAMB'S VALUE CUTS AS WELL AS PREMIUM CUTS.

BY MARIAH MEURER

AMERICAN LAMB BOARD

The American Lamb Board (ALB) has long been at the forefront of promoting US-raised lamb, ensuring it remains a staple on both restaurant menus and home dinner tables. In 2024, the ALB continues its mission, adapting to evolving consumer preferences and industry challenges. A key focus this year has been on promoting the versatility of value cuts - an essential strategy to ensure lamb's enduring appeal in a rapidly changing food landscape.

Historically, lamb has been synonymous with premium cuts like rack or loin chops. These cuts have graced the tables of fine dining establishments and have been the go-to choice for home cooks looking to impress. However, the ALB recognizes that for lamb to maintain and grow its presence in the American diet, it must be more than just a luxury item. Enter the promotion of value cuts.

In 2023, the ALB took significant steps to highlight the versatility and affordability of cuts like legs, shoulders, shanks, and ground lamb. A prime example of this effort was the leg promotion hosted in collaboration with Chefs Roll, and the May Lamb Jam dinearound month, where ALB donated lamb to 56 restaurants. The focus was clear: showcase how these value cuts can be creatively incorporated into diverse and delicious dishes.

This strategy not only resonated with chefs and restaurateurs but also with consumers. Ground lamb, in particular, has seen remarkable growth. Retail dollar sales were up 6.8% in 2023 compared to 2021, and volume sales saw a 5.1% increase. This upward trend demonstrates a growing appreciation for lamb's versatility beyond the traditional premium cuts.

The pandemic brought unprecedented challenges to the foodservice industry, and lamb was not immune to these impacts. Fine dining, a sector that has traditionally been a stronghold for premium lamb cuts, continues to struggle with inflation, food costs, and labor shortages. As a result, many restaurants are rethinking their menus, often turning to more economical cuts to manage costs while still offering high-quality dishes.

ALB's promotion of value cuts has proven timely. By incorporating cuts like ground lamb and shoulder into their menus, restaurants can offer delicious, innovative dishes that appeal to a broader audience while keeping costs in check. This shift not only helps restaurants navigate the current economic landscape but also introduces consumers to the full spectrum of lamb's culinary potential.

While the focus on value cuts has been successful, the ALB understands the importance of maintaining demand for premium cuts like the rack and loin. These cuts are not just iconic—they are critical to balancing the value of the whole lamb carcass. Ensuring that all parts of the lamb are in demand is vital for the economic sustainability of the US sheep industry.

Recognizing this, the ALB is developing strategies to "bring back the rack." The quintessential dining experience of a meaty, tender American Lamb chop is one that many consumers still crave. The goal is to reignite interest in these premium cuts, reminding both chefs and home cooks of their unmatched quality and flavor.

The push to "bring back the rack" builds on the momentum of previous marketing efforts like the "Get a Leg Up" campaign and the Lamb Jam events, which successfully highlighted ground lamb and leg cuts. These campaigns have shown that with the right promotion and support, even lesser-known cuts can gain traction in the market.

As the ALB moves forward with its plans, there will be a strong emphasis on creating awareness and demand for premium cuts. This will involve targeted promotions, chef collaborations, and consumer education, all aimed at showcasing the unique qualities of American Lamb.

Looking ahead, the ALB is committed to ensuring that American Lamb remains a versatile, sustainable, and beloved protein choice. The dual approach of promoting value cuts while reviving interest in premium cuts will help balance the market, supporting both producers and consumers.

The U.S. sheep industry is not just about meat—it's about tradition, sustainability, and innovation. As the ALB continues its work, it will keep these values at the forefront, ensuring that American Lamb remains an integral part of the nation's culinary landscape.

In a world where food trends come and go, American Lamb stands out as a product of lasting quality and appeal. Whether it's a casual family dinner featuring ground lamb or a special occasion showcasing a perfectly cooked rack of lamb, there's a place for this exceptional protein in every kitchen.

As the ALB works to "bring back the rack," it does so with the confidence that American Lamb's future is bright. With ongoing efforts to promote all cuts of lamb, from the most affordable to the most premium, the ALB is paving the way for a new era of lamb appreciation—one that honors the past while embracing the future.

Mariah Meurer is culinary marketing manager for the American Lamb Board.

Photo credit American Lamb Board



AT RETAIL, BOTH DOLLAR SALES AND POUNDS SOLD ARE DOWN.

BY FRED WILKINSON

CHIEF EDITOR

According to the US Department of Agriculture, US veal production for January through July 2024 totaled 23.5 million pounds, down from 27.1 million pounds for the same period in 2023.

At retail, both dollar sales and pounds sold are down, according to retail market data analysis from Circana.

From August 2023 through August 2024, veal sales totaled \$44 million, a -9.5% decline in dollar sales and -9% decrease in pounds sold compared with August 2023. For August 2024, veal sales were \$3.8 million, with dollar sales down -4.1% and pounds sold down -6.5% from a year ago.

While sales of grinds for beef, chicken and turkey are enjoying sales growth, veal grinds are struggling, with monthly ground veal sales have fallen below \$1 million.

Circana retail analysis finds ground veal sales for August 2024 were \$800,000, with dollar sales down -4.6% and pounds sold falling -12.1%. From August 2023 through August 2024, ground veal sales totaled \$9.5 million, with dollar sales dropping -9.8% and pounds sold off by -17.6%.



ANIMAL WELFARE ISSUES

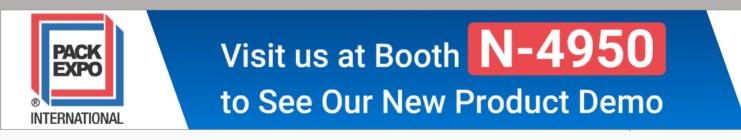
The American Veal Association has updated its Veal Quality Assurance program. The effort reflects a science-based technical review conducted by a nine-member advisory group, including university animal scientists, nutritionists, veterinarians and a USDA Animal Research Service animal scientist.

The 2024 updated edition of the Veal Quality Assurance resource manual includes a focus on providing defined processes, practices, and outcome measurements for achieving welfare goals. These "Five Domains" reflect the advancement of animal welfare and animal science and the importance of promoting positive physical, behavioral, and mental states and minimizing negative states for livestock.

The Veal Quality Assurance resource manual includes 52 Expected Outcomes focusing on animal health, animal care and handling, facilities and environmental conditions, and general management, including employee training.

A significant change to the manual for 2024 was the addition of condition scores for veal. Monitoring body condition and performance assessments show where calves are thriving and growing, as well as where there may be health and nutrition issues to be addressed.

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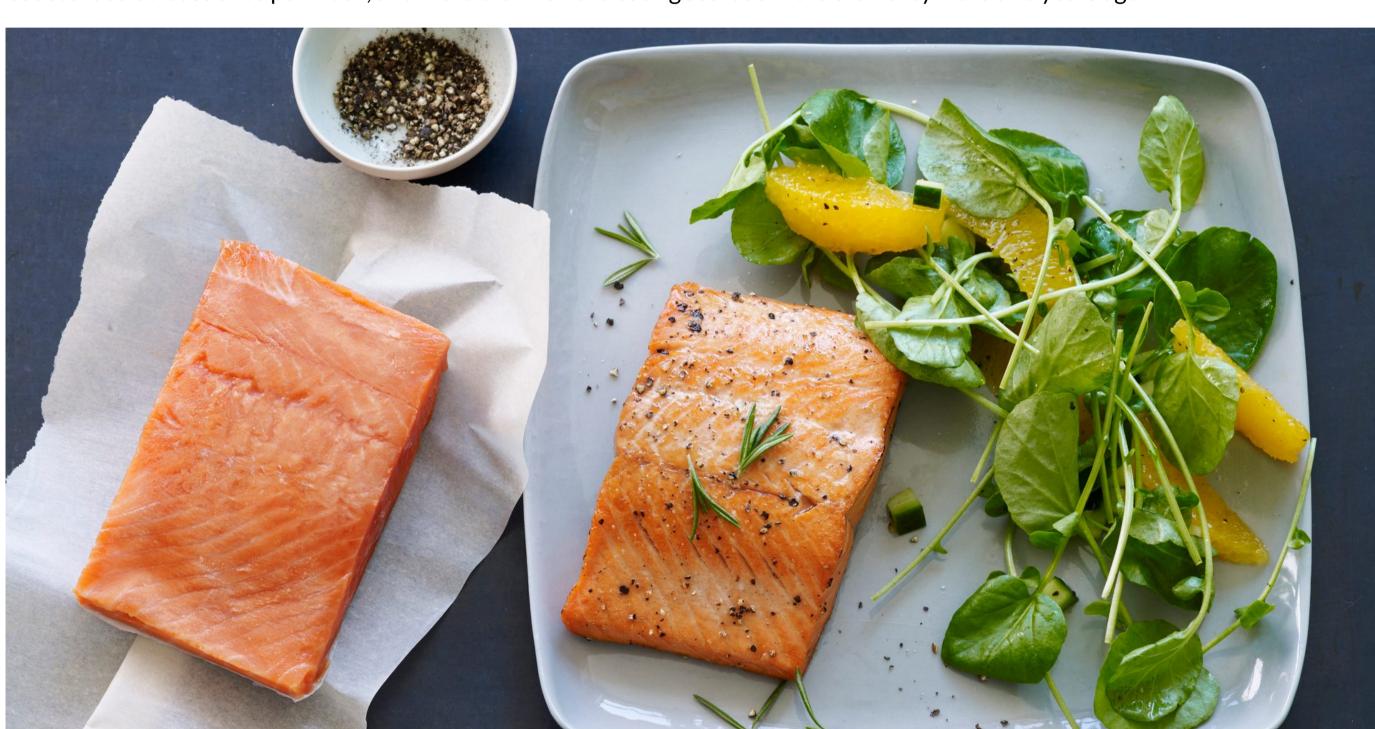


MESSAGING FOCUSING ON SEAFOOD'S NUTRITION, SUSTAINABILITY AND COOKING TIPS RESONATES WITH CONSUMERS.

BY MEGAN RIDER

ALASKA SEAFOOD MARKETING INSTITUTE

Despite inflationary pressures in the first half of the year, global consumption of seafood is on track for 2024 to surpass prepandemic levels, providing a reassuring outlook for the industry at large. The fish and seafood market is projected to show a 2.3% volume growth in 2025, with annual revenue growth of 3.88% through 2029. Those projections are supported by current consumer attitudes: According to research from Circana on behalf of Alaska Seafood Marketing Institute (ASMI), 61% of consumers eat seafood at least once per week, and more than half are eating seafood more than they were two years ago.²



In order to make the most of this recovery, here's what processors, retailers and foodservice operators should focus on in the year ahead.

- Highlight nutrition benefits: Seafood is full of high-quality protein, vitamins, minerals and naturally occurring omega-3 fatty acids EPA and DHA that are vital to heart and brain health, all factors that continue to drive consumers to the category. In fact, 68% of consumers believe seafood's nutrition benefits set it apart from others in the protein category3 and 78% of frequent seafood consumers say they prioritize health and nutrition.4 Marketing efforts should continue to communicate the health benefits of seafood, which consistently win out against other proteins.
- Provide cooking inspiration: Home-cooked seafood constitutes 59% of seafood consumption, up from 53% last year, with restaurant consumption decreasing an equal amount.4 While sales and promotions are the primary in-store purchase driver, 2 in 3 shoppers say cooking guidance, like recipes, techniques and more, would inspire them to consume seafood more often.5 For both cost and convenience, shoppers are attracted to value-added products like marinated filets or fresh-prepared items like kebabs and salmon cakes. For example, an Alaska seafood wholesaler recently launched frozen miso-glazed Alaska black cod filets to great success, introducing what was traditionally perceived as a high-end, luxury species to aspiring home cooks around the country. Cooking inspiration tied to key seasonal moments like simple meals for Back to School time periods or how to weave seafood into upcoming holidays is also beneficial.
- Emphasize source and sustainability: Seafood consumers prefer wild-caught seafood 4:1 over farmed, and across the U.S., shoppers prefer seafood from Alaska 5:1 compared to other sources.2 For processors, retailers, and foodservice operators, this means continuing to highlight the source, such as Alaska, as well as sustainability certifications, such as Responsible Fisheries Management (RFM). Ensuring that sustainability is communicated to the end-buyer via the seafood counter staff, labeling or menuing will also help to increase sales; 82% of consumers are more likely to buy seafood when they see the Alaska Seafood logo, as they associate it with fresh, great-tasting, and high-quality seafood.2
- Provide Variety: Seafood in more formats means more sales overall seafood sales at retail increased over the past 4 years in every segment including refrigerated, frozen and shelf-stable. 79% of seafood consumers are likely to buy frozen seafood, which is seen as affordable, convenient and increasingly recognized as equal in quality to fresh. Plus, having it available and promoted year-round in more places in the store will ensure that consumers are able to easily find and purchase it.
- Take Risks in Foodservice: For the 88.1% of restaurants that menu seafood, operators shouldn't be afraid to branch out, with consumers often looking to try out new seafood species in foodservice environments. One major quick-serve chain saw massive success menuing Alaska flounder for their fish sandwich in 2024, in place of the more often used pollock or cod. We also continue to see more restaurants and chefs showcasing sablefish in a variety of ways due to its rich, buttery flavor profile. As consumers eat more seafood overall, restaurants can serve as an entry point to new varieties.

The seafood industry faced a challenging year in 2024, riding the waves of supply, demand and inflationary pressures. But overall seafood consumption remained steady, and poised for growth as inflation eases; in fact, 74% of consumers wish they ate seafood more than they do. Industry members can help them do so in 2025 by focusing on nutrition, sustainability, cooking tips, and offering new varieties.

Megan Rider is domestic marketing director for the Alaska Seafood Marketing Institute.

¹Statista

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- ² Circana for ASMI, December 2023
- ³ Mintel Fish & Seafood 2024
- ⁴ FMI 2024 Power of Seafood Report
- ⁵ Material+ for ASMI, 2023

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WITH AN AGING WORKFORCE AND INCREASED COMPETITION FOR WORKERS, BUSINESSES OFTEN STRUGGLE TO MEET STAFFING NEEDS.

BY LACY BATES

The meat industry, a vital segment of the agricultural sector, plays a crucial role in the economy by providing essential protein to populations worldwide. Despite its significance, the industry faces numerous labor-related challenges that threaten its productivity and growth. These challenges include labor shortages, rapid technological advancements, and evolving regulatory frameworks. While these issues can be daunting, Farmer Enterprises effective strategies such as employment-based immigration and domestic recruitment can help overcome them.

ADDRESSING LABOR SHORTAGES

Labor shortages remain a significant concern for the meat and poultry industry. With an aging workforce and increased competition for skilled workers, businesses often struggle to maintain adequate staffing levels. Employment-based immigration presents a viable solution by opening access to a global talent pool. By recruiting international workers, meat and poultry businesses can fill critical gaps and sustain their operations without compromising on productivity or profitability.

LEVERAGING TECHNOLOGICAL ADVANCEMENTS

Technological advancements are transforming the meat industry, introducing automation and robotics into production processes. These innovations promise increased efficiency but also demand a workforce proficient in new technologies. To harness these advancements, businesses must focus on recruiting individuals with the necessary technical skills. Investing in training programs and partnering with educational institutions can also help develop a workforce capable of operating advanced machinery.

ADAPTING TO REGULATORY CHANGES

The meat industry is subject to frequent regulatory changes that impact production standards and labor practices. Staying ahead of these changes is crucial for maintaining compliance and avoiding penalties. Businesses should establish robust compliance programs and regularly consult with industry experts to ensure they remain informed about new regulations. Proactive adaptation not only helps in compliance but also positions businesses to anticipate and respond to future regulatory shifts.

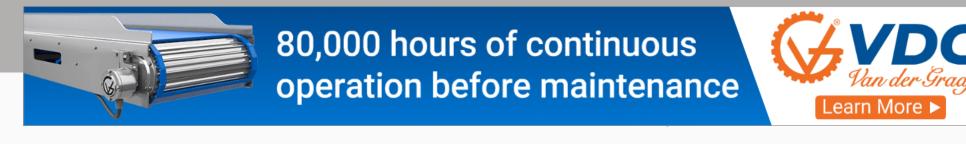


WRAPPING UP

Cattle farms will continue to face significant labor challenges, but with strategic planning and implementation, these labor challenges can be addressed easily and effectively. Now is a fantastic time to start leveraging employment-based immigration and domestic recruitment to manage labor shortages and embrace technological advancements through skill development.

For companies seeking to solve their labor needs, Farmer Enterprises offers expert assistance, recruitment, and guidance in navigating these complex issues. Contact us today to learn how we can support your business in overcoming your labor challenges.

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BUTTER AND LARD AS COATING MATERIALS IN BEEF AGING

OVERALL, LIPID-COATED AGING DID NOT SHOW CLEAR ADVANTAGES OVER WET AGING.

BY JONATĂ HENRIQUE REZENDE-DE-SOUZA, GABRIEL BARÃO ARIAS BLANCO AND SERGIO BERTELLI PFLANZER

Beef tenderness is a crucial attribute for consumers and can be enhanced by aging, which uses endogenous enzymes to alter the structure of meat fibers. The main aging techniques is wet aging, which involves vacuum packaging with low oxygen pressure; and the dry aging, which occurs without packaging and results in water evaporation and flavor concentration. However, a new type of meat aging is gaining traction in the sector, known as butter aging. In this process, the meat is coated with a layer of butter before aging. Its justification for use lies in enhancing flavor, thereby intensifying the consumer's sensory experience. Our objective was to investigate the effect of milk butter, compared to pork lard, as coating materials in the meat aging process.

The study utilized 36 portions of boneless loins without subcutaneous fat were used, divided into three treatments: vacuum aging, butter aging, and lard aging. Samples for wet aging were vacuum-sealed and placed in the aging chamber for a period of 28 days. Samples of lipid coating were hung for two days for surface drying to improve fat adhesion. After drying, the lipid layer was applied to the meats, which were hung for another two hours to dry, then weighed, and aged for 26 days. In total, all samples aging for 28 days. The entire aging process was conducted at 2°C, with 80% relative humidity and an airflow of 2.5 m/s.

Various meat quality attributes were analyzed after aging, including pH, water activity, moisture content, total lipid and total protein, protein oxidation, color stability, lipid oxidation, instrumental tenderness by the Warner-Bratzler method, and the determination of volatile compounds in cooked meat. The microbiological profile was also evaluated, with counts of psychrotrophic and mesophilic bacteria, lactic acid bacteria, molds, yeasts, and enterobacteria.

The results demonstrated an average lipid adhesion rate of 24.27%. After aging, the lard-aged samples losses 3.52% of their weight, while the butter-aged samples losses 1.53%. When dehydration losses from the initial two days were added, the total weight loss was 8.51% for butter-aged and 10.70% for lard-aged, higher than for wet-aged (3.21%) but lower than for dry-aged, which can result in up to 50% weight loss. The higher weight loss in lard-aged samples is attributed to the physicochemical composition of lard, which has a lower saturated fatty acid content (36.44%) compared to butter (69.91%) and a lower melting temperature (-22.68 °C), favoring greater dehydration in meat.

Samples with lipid coatings had higher pH (5.6) compared to wet-aged samples (5.42). The surface water activity was lower in lardaged samples (0.9882) compared to wet-aged samples (0.9917), due to the lard composition. Aging did not significantly affect the moisture content, total lipids, protein oxidation, and instrumental tenderness. The luminosity of the samples was not affected by the type of aging, but storage time increased the lightness of the samples. Only the a* coordinate showed a significant interaction between aging type and storage time, with butter-aged and lard-aged samples showing higher color oxidation, with a 23.57% and 30.97% decrease in red color intensity for butter-aged and lard-aged, respectively, compared to vacuum aging.

Lipid oxidation, determined by the quantification of malonaldehyde content, also showed a significant interaction between aging type and storage time. In general, butter-aged samples were more oxidized than other treatments, possibly due to the higher water concentration between the meat and lipid layer and the presence of oxygen in the meat-fat system, caused by microcracks in the lipid layer.

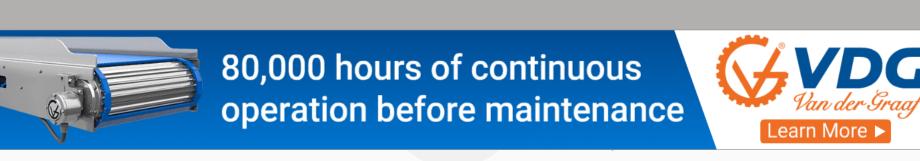
Volatile compounds are essential for flavor and aroma and can be affected by meat processing and storage. This analysis was conducted on samples from the three aging treatments and fresh samples using gas chromatography coupled to a quadrupole mass spectrometer. Fresh meat had 14 unique compounds, while vacuum-aged meat had seven unique compounds, including esters and ketones. Butter-aged samples had five specific compounds, including alcohols and pyrazines, while lard-aged samples showed no distinct volatile compounds. Overall, 123 compounds were detected in fresh samples, 107 in wet-aged, 118 in butter-aged, and 99 in lard-aged samples. These differences in volatile composition highlight how aging methods and treatment characteristics influence the meat's volatile profile, resulting in distinct sensory characteristics for each aging type.

Microbiologically, butter-aged samples had higher psychrotrophic counts and visible signs of spoilage. Wet-aged samples had an average psychrotrophic count of 7.18 Log, with no visible signs of spoilage. Lard-aged samples had an average count of 7.42 Log, with signs of mucus and acidic aroma. Butter-aged samples showed higher psychrotrophic counts, accompanied by visible signs of spoilage and higher lactic acid bacteria counts. Enterobacteria, mold, and yeast counts showed no significant differences between treatments.

Using lipid coatings in meat aging resulted in products with similar physicochemical characteristics to wet aging, with butter aging showing higher final yield than pork lard. Color and microbiological quality were more satisfactory in lard-aged samples, while butter-aged samples had color issues and visible spoilage. Overall, lipid-coated aging did not show clear advantages over wet aging under the conditions of this study. Therefore, it is suggested that future studies consider shorter aging times to assess the commercial viability of these products.

Rezende-de-Souza, J. H., Nassu, R. T., Macedo, R. E., Francisco, V. C., Karwowski, M. S. & Pflanzer, S. B., (2024) "Yield and Quality Attributes of Aged Beef through Lipid Coatings: A Comparative Study of Milk Butter and Pork Lard", Meat and Muscle Biology 8(1): 16909, 1-12. doi: https://doi.org/10.22175/mmb.16909

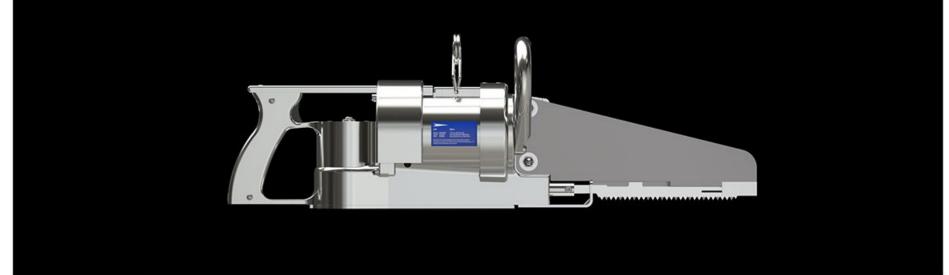




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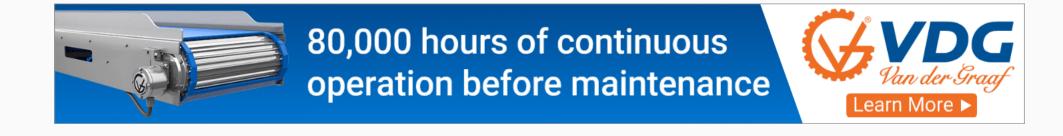






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