

2017

ANNUAL REPORT

*A Year of Savory Results*





# STRATEGIC PRIORITIES

- 1. Direct to consumer marketing to increase mango consumption and awareness
- 2. Increase presence and sell-through of mangos at retail
- 3. Increase presence and sell-through of mangos at foodservice
- 4. Generate knowledge through research efforts in support of the vision
- 5. Enhance industry communication and preparedness to create a unified industry

## MISSION

Increase consumption of fresh mangos in the United States (U.S.) through innovative research and promotional activities, while fostering a thriving industry.

## VISION

To bring the world’s love of mangos to the U.S.

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## LETTER FROM THE EXECUTIVE DIRECTOR

The National Mango Board (NMB) is proud to report that fresh mango continues to make significant progress on the road to becoming an everyday favorite fruit for Americans. Mangos are entering the ubiquitous phase in U.S. consumer acceptance. The mango industry established the NMB in 2004 with the purpose of wisely and effectively investing the industry's hard-earned dollars into promotion and research programs that increase mango consumption and foster a thriving industry. This year, I am proud to share some noteworthy results, which include the continued growth of mango consumption and positive consumer trends, the NMB's role as a trusted partner, and strategic enhancements to the NMB programs.

Mango consumption in the U.S. continues to rise. In 2017, consumption reached an all-time high, with an annual per capita consumption of 3.42 lbs per person. This represents an impressive increase of 15% compared to the prior year. We know that much of this growth is happening during the spring and fall months. For example, for the last two years, mango has been one of retail's fastest growing produce items during the back-to-school season. Another key area that similarly continues to have an upward trajectory is the value-added category, which includes fresh-cut and the Ripe and Ready to Eat Mango Program. According to Nielsen Fresh Facts, fresh-cut mango mix was the fastest growing fresh-cut fruit item at retail with a 47.6% growth over the previous year.

Without a doubt, the NMB's reputation as a trusted partner and resource for valuable mango information also continues to expand. In 2017, the NMB aligned with several distinguished food companies, including Del Monte Fresh, Wendy's Restaurants, and Tajin, to improve mango quality, conduct joint promotions and reach more consumers. These were exciting partnerships and serve as a constant reminder of the NMB's purpose of working with mango trailblazers to generate promotions and research information that will continue to inspire consumers to eat more mango. Over the last three years, the NMB has supported over 36 research projects in the areas of nutrition and health, postharvest and quality, food safety, sustainability, value-added, varietal, crop forecasting, and consumer research. The NMB constantly communicates these research results through conferences, outreach events, webinars, press releases, social media channels, and the *mango.org* website.

The NMB continues to generate outstanding results for mango stakeholders, and the single measurement that best summarizes the NMB's overall effectiveness is the benefit cost ratio, which has reached a phenomenal 18.48 to 1 ratio. In other words, for every dollar invested into the NMB programs, \$18.48 in benefits are generated back to the mango industry. This benefit cost ratio represents one of the highest returns of any agricultural promotion program in the U.S. Over this year, the NMB has worked diligently to maintain this high level of performance and to continue increasing mango demand and awareness. We have also reviewed and updated the strategic plan, strengthened the programs and implemented several organizational changes, including the addition of new partners and team members. As a result, the NMB is now stronger and more equipped to continue addressing challenges and is better prepared to capitalize on opportunities that will take the mango industry to new levels in the coming years.

I invite you to review this report for additional highlights. On behalf of everyone that is a part of "Team Mango", a sincere thank you for all your support.

*All the best,  
Manuel Michel*



*"In 2017, consumption reached an all-time high."*



## LETTER FROM THE CHAIRMAN

2017 was a year of strong growth for our industry with volume increasing from 109 to 117 million boxes and reaching an estimated FOB value of \$555 million dollars, both new records. The NMB marketing programs delivered our highest ROI to-date at the same time that the Board achieved its strongest financial position ever. This leaves us the ability and the task to imagine the next big leap forward for our industry.

*“Flavor is the ultimate key to unlock our potential and grow our industry.”*

We had many achievements, but what most inspires me is the transformational change we made as a Board in 2017. This came in several forms: a new 3-year strategic plan; deep new learning about our consumer; the addition of new talent to the staff; and the selection of a new consumer agency. The new strategic plan outlines our objectives, the activities that will achieve the objectives, the outcomes we expect, and the metrics we will use to track progress. This plan was developed with the final consumer as our focus and the conviction that flavor is the ultimate key to unlock our potential and grow our industry. We gained deep new knowledge of our consumer through focus groups, on-line social interactions and menu

research. This resulted in a deeper understanding of mango’s versatility and the barriers and triggers to consumer purchase. The rebuilt marketing staff brings a rich background in the discipline of consumer branded goods. Finally, our new consumer agency was hired to tell compelling stories that touch consumers with a greater depth of understanding using targeted digital strategies and advanced analytics.

A clear highlight of 2017 was our partnership with celebrity food influencer Ayesha Curry. Ayesha inspires a key demographic; moms who are passionate about good food and nutrition for their families. We extended our influencer network with mommy bloggers, kid chefs and, for the first time ever, used paid amplification of great on-line mango articles to achieve massive digital distribution to our target audience. In the foodservice program, the Wendy’s Strawberry Mango Chicken Salad proved that fresh mango could be incorporated into a national menu in the quick-serve restaurant (QSR) environment. Our retail team delivered a 14% increase in stores-on-ad, a 5% increase in fresh whole mango and 12% increase in fresh-cut sales volume per store per week. Our Retail Dietician Challenge program reached millions of consumers through in-store signage, demos, and media outreach. Finally, our Ripe-and-Ready program nearly doubled to include 11 retailers and 7,000 stores receiving ripened mangos.

The 2017 research program continued to build our body of evidence on the nutritional benefits of mangos with studies on gut health, inflammation, and metabolic activities. A new study on the fresh-cut mango industry will result in a best practices manual to improve the final product to the consumer. We added new research on multiple postharvest topics that add value to industry stakeholders as evidenced by the growing attendance and high satisfaction ratings of our extension meetings. I encourage all in our industry to go to [mango.org](http://mango.org) to use the wealth of resources your assessment funds have generated through our research programs.

On behalf of the Board and the mango industry, I would like to congratulate Manuel and the NMB staff for an amazing year of achievement, change for the better, and preparation for the future. I could not be more excited about where we are heading, the plan and the team we have built to take us there and to simply experience the journey with the fine people that make up this great industry. It has been an honor and a pleasure to serve as chairman of this fantastic organization representing the industry I love.

*All the best,  
Greg Golden*



2017

## BOARD OF DIRECTORS

- Greg Golden, Chair  
*Importer District II*
- JoJo Shiba, Vice Chair  
*Importer District II*
- Patrick F. Dueire, Secretary  
*First Handler*
- Michael B. Warren  
*Treasurer, Importer District I*
- Jiovani Guevara  
*Marketing Committee Chair  
Importer District III*
- Eddy Martinez  
*Research Committee Chair  
Foreign Producer*
- Chris Ciruli  
*Importer District III*
- Enrique Sanchez  
*Foreign Producer*
- Jacque Swett  
*Foreign Producer*
- Joaquin Balarezo Valdez  
*Foreign Producer*



- Marsela McGrane  
*Importer District IV*
- Shawn Allen  
*Importer District II*
- Norberto Galvan Gonzalez  
*Foreign Producer*
- Oscar Orrantia  
*Foreign Producer*
- Web Barton  
*Domestic Producer*
- Susan Underwood  
*Importer District I*
- Tomás Paulín Quezada  
*Foreign Producer*
- Veny L. Marti  
*Domestic Producer*

## FINANCIALS

BDO USA, LLP, accountants and consultants, audited the NMB financial statements of fiscal year 2017 and issued a report on March 13, 2018. The audit was done in accordance with auditing standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the U.S. BDO USA, LLP did not identify any deficiencies in internal control over financial reporting for 2017.

### Revenues

Assessments	\$8,329,903
Interest income	197
<b>Total revenues</b>	<b>\$8,330,100</b>

### Expenses

<b>Program expenses</b>	
Marketing	\$3,605,627
Communications	436,366
Research	1,223,654
Board meetings	119,657
<b>Total program expenses</b>	<b>\$5,385,304</b>

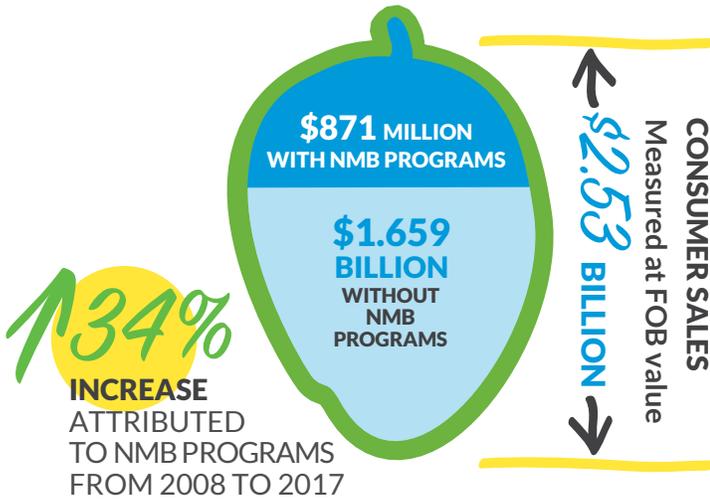
### General and administrative expenses

Overhead	\$478,091
USDA and U.S. Customs	144,057
Rent	88,369
Depreciation and amortization	43,605
Loss on disposal of equipment	19,154
<b>Total general &amp; administrative expenses</b>	<b>\$773,276</b>
<b>Total expenses</b>	<b>\$6,158,580</b>

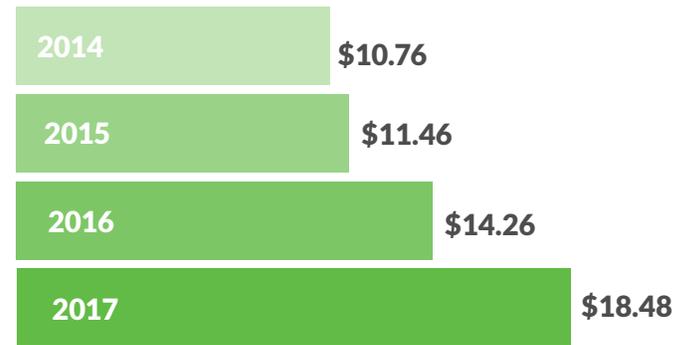
<b>Change in unrestricted net assets</b>	<b>\$2,171,520</b>
Unrestricted net assets (beginning of year)	4,389,630
<b>Unrestricted net assets (end of year)</b>	<b>\$6,561,150</b>

# STATE OF THE MANGO INDUSTRY

## NMB CONTRIBUTION



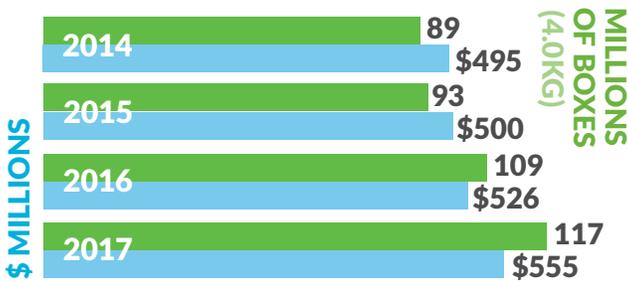
## RETURN ON INVESTMENT



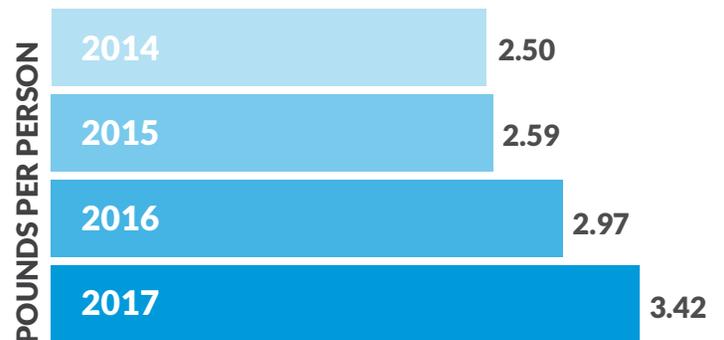
FROM 2008 TO 2017, FOR EVERY DOLLAR INVESTED IN THE NMB, THE INDUSTRY SAW A RETURN OF

**\$18.48**

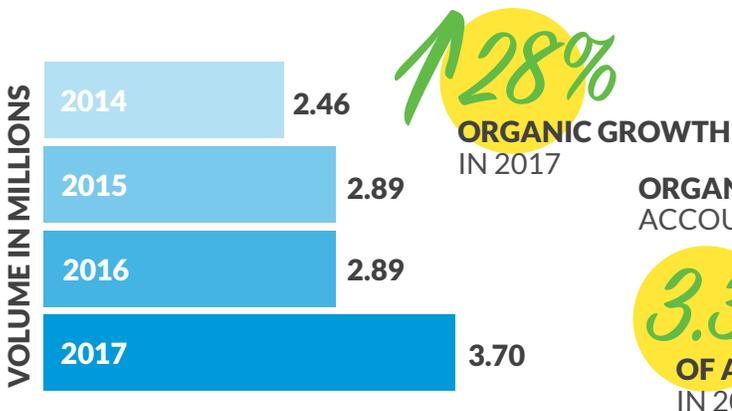
## IMPORT VOLUME AND VALUE



## PER CAPITA AVAILABILITY



## ORGANIC WHOLE MANGO PERFORMANCE

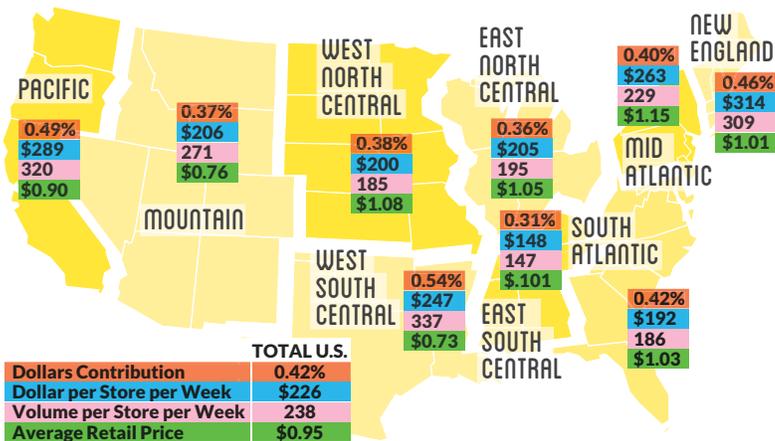


ORGANIC MANGOS ACCOUNT FOR



# MANGO PERFORMANCE AT RETAIL

## WHOLE MANGO REGIONAL PERFORMANCE



## WHOLE MANGO PERFORMANCE

**↑15%**  
INCREASE  
IN VOLUME IN 2017

### VOLUME/STORE/WEEK

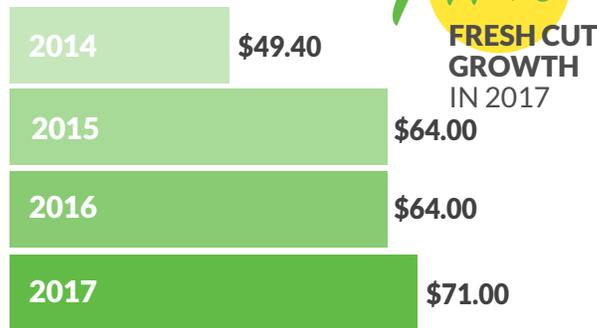


**↑4%**  
INCREASE  
IN \$/STORE/  
WEEK IN 2017

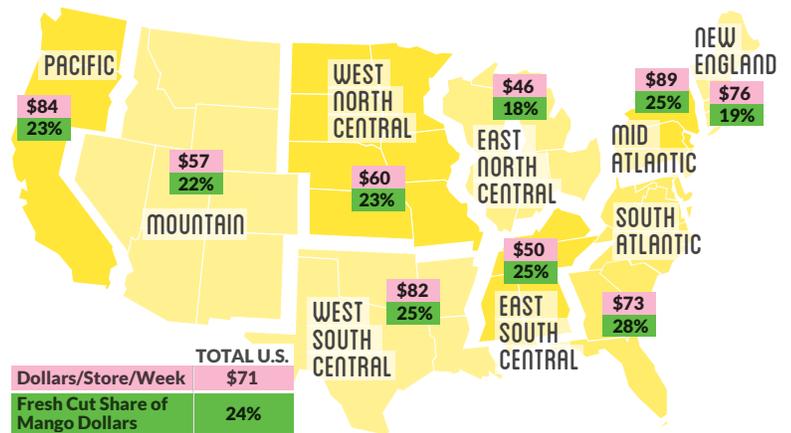
### AVERAGE DOLLARS/STORE/WEEK

## FRESH-CUT MANGO PERFORMANCE

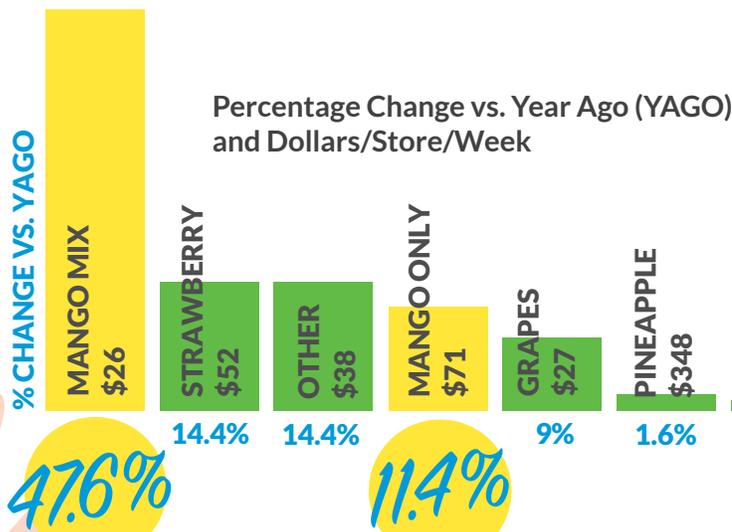
### DOLLARS/STORE/WEEK



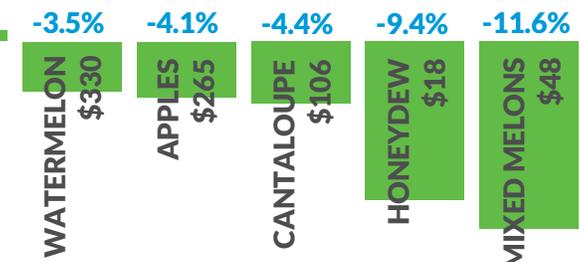
## FRESH-CUT MANGO REGIONAL PERFORMANCE



## GROWTH OF FRESH-CUT FRUITS



FRESH-CUT FRUITS	TOTAL U.S.
Increase in volume in 2017	0.4%
Dollars/store/week	\$2,110



# MARKETING PROGRAMS

The marketing program aims to educate and inspire U.S. consumers to choose mangos more often in grocery stores and foodservice avenues. The NMB's marketing efforts seek to connect and drive mango awareness with consumers, educate retailers and encourage mango promotions, and inspire chefs and foodservice operators to increase fresh mango items on the menus.

## HIGHLIGHTS

- "Mango As A Cultural Icon" was awarded the Produce Business Marketing Excellence Award. It was the 9th consecutive year that NMB received this award!
- Record 3 billion consumer media impressions
- Fresh mango penetrated the QSR segment with Wendy's salad
- Exciting brand partnerships with Tajin and Del Monte
- Mango + Tajin was the top breakout search related to Tajin, according to Google Trends

Google Trends	
• Tajin	
1	mango with tajin
2	tajin chips
3	cumbre tajin



# CONSUMER MARKETING IMPACT

## CONSUMER RESEARCH to inform development of compelling mango messages to drive industry growth.

Focus groups conducted in 2017 explored current mango perceptions while the Attitudes and Usage Study performed was designed to build on work done in 2013 to track mango awareness, gain a deeper understanding of mango perception and identify beliefs and behaviors that impact purchasing. The key findings of this study will directly influence marketing programs in the coming years.

### What Consumers Are Saying:

MANGO PURCHASERS ON THE INCREASE			
Have Purchased Mango	2007	54%	
	2013	60%	
	2017	67%	
Have Never Purchased Mango	2007	46%	
	2013	40%	
	2017	33%	

"My family is from the Philippines, we've been eating it forever - mango ice cream, mango shakes on the beach, etc."

"Mangos are a crazy wild experience that's definitely worth every single bite. It's messy but it's definitely worth it."

Mango Enthusiast

Fence-Sitter

### Key Consumer Learning Highlights

- The leading reason for not purchasing is not knowing how to select a ripe mango. 78% of non-purchasers don't know how to select a mango.
- The 2nd leading reason for not purchasing is not thinking about mangos.
- Over 50% of mango purchases are unplanned.
- 34% of past purchasers are confused about the mango seasons (availability).

These studies provided a wealth of learnings. How to select, how to cut, availability and versatility remain the key messages for driving mango awareness and consumption. Unique flavor profile, nutrition and health benefits are star points to weave into the mango messaging. The NMB is well poised to develop and share compelling mango messages to continue to drive industry growth.

## MANGO MOMENTS AND EVENTS to share the mango love.



Sampling in Chicago Public Schools with Del Monte - 80,000 students in 97 schools received mango samples, fact sheets and promo items.



Sampling with Tajin at Maker Faire - Over 5,500 fresh mango samples as well as Tajin sachets were distributed at Maker Faire event in the Bay Area of California.



Sampling at Solstice in Times Square - 4,400 fresh mango samples and 1,000 Wendy's Strawberry Mango Salad coupons distributed in NYC.

**INFLUENCER PARTNERSHIPS to educate, inspire and share the mango message.**

Ayesha Curry was the most successful celebrity partnership in NMB history, with over 548 million media and social impressions. NMB’s Instagram followers doubled throughout the partnership with Ayesha and she featured mango as her favorite ingredient in a Food & Wine Magazine Q&A and top tier online placements in LA Times, Chicago Tribune, San Francisco Chronicle, Houston Chronicle.



Mango Smoothie Bowl from Meet Your Mango partner, Alice Choi of Hip Foodie Mom.

The Meet Your Mango campaign, a partnership with foodie bloggers, had over 7 million impressions. Bloggers leveraged the use of NMB produced educational videos (“How To Cut” and “Selecting and Storing”) and were featured on Good Morning America. The Kid Chefs partnership garnered over 100K video views and over 2.5 million impressions.



Kid Chefs, Charli and Ashlee, shared their mango pudding pops recipe just in time for summer.

**MESSAGE AMPLIFICATION to reach a wider audience with messages that resonate.**

The NMB started to utilize paid amplification to leverage articles. Examples included “Mango Obsession” via Outbrain, as well as our Meet Your Mango partner Natasha Kravchuk’s Layered Mango

**Mango obsession: How to eat them for breakfast, lunch, dinner, and dessert**



Cake, via Taboola, which resulted in over 47.7 million impressions. These platforms allowed for testing headlines and images across multiple mobile and desktop devices.



## DIGITAL STRATEGIES with increased integration across NMB channels.

Content creation was a key focus in 2017. The NMB created five How-To videos, including “How to Select and Store”, “How to Cut” and three recipe videos. These videos generated over 250K views on YouTube and over 175K views via NMB social media channels.

The *mango.org* website saw a massive increase in traffic, with page views up by 43% and site visitors up by 53% compared to the prior year. The *mango.org* blog was a top priority, with the addition of weekly lifestyle and culture-focused posts, which resulted in a 47% increase in traffic.

Social Media continued to play a significant role in relaying the mango message and earned over 10 million social media impressions. This includes the “Mangos Around the World” sweepstakes, which had 18K entries and 77K social media engagements.



## NUTRITION MARKETING IMPACT

The Nutrition Ambassador Program partnered with eight Registered Dietitian Ambassadors who secured mango media placements both online and on television, which resulted in over 377 million nutrition media impressions.

The NMB developed a Culinary Demonstration Guide featuring everything a nutrition influencer could need to conduct a successful culinary demo featuring mango.

The “Share. Mango. Love.” campaign wrapped up, completing a two-year run of sharing the world’s love of mangos among RD’s and nutritional media.

Award-winning Registered Dietician (RD)/nutritionist, Manuel Villacorta, featured mango in Huffington Post and across his social media channels.



# FOODSERVICE MARKETING IMPACT



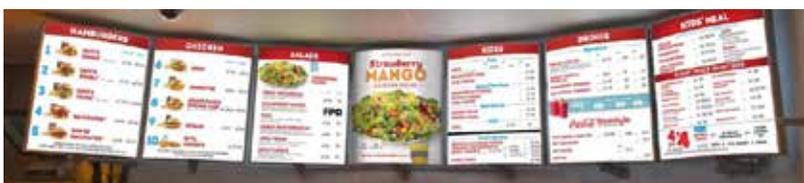
## A BIG WIN WITH MANGOS AT WENDY'S

The NMB secured its first fresh mango menu promotion with a QSR Brand. The Wendy's Strawberry Mango Summer Salad limited time offer (LTO) menu promotion ran from June 5 through September 1, 2017. It was also the first year that the salad included a fruit other than berries.

Wendy's featured the mango inspired salad on indoor and outdoor Point-of-Sale (POS) locations, as well as two TV commercials, public relations and social media, putting it at the forefront of consumers' minds. The salad was available at 5,720 locations across the country.



SALADS		Full	Half
<b>STRAWBERRY MANGO</b>			
<b>FRESH MOZZARELLA</b>	Crunchy Chicken, Fresh Mozzarella, Basil Peppers, Light Balsamic Vinaigrette	6.99	5.49
<b>STRAWBERRY MANGO</b>	Crunchy Chicken, Strawberry, Mango, Honey Citrus Vinaigrette	6.99	5.49
<b>TACO</b>	Wendy's® Chili, Tomatoes, Cheddar Cheese, Salsa, Sour Cream	6.49	4.99
<b>POWER MEDITERRANEAN</b>	Crunchy Chicken, Grapes, Blue Cheese, Croutons, Balsamic Vinaigrette, Light Balsamic Vinaigrette, Qd Dressing	6.49	5.99
<b>APPLE PECAN</b>	Crunchy Chicken, Apples, Blue Cheese, Croutons, Balsamic Vinaigrette, Honey Citrus Vinaigrette	6.99	5.49
<b>SPICY CAESAR</b>	Spicy Chicken, Bacon Cheese Blend, Tomatoes, Croutons, Caesar Dressing	6.99	4.99



## Four Additional Brands Added Mangos to the Menu

Other brands that added new mango items in 2017 as a result of NMB outreach included Gordon Biersch (Core menu item: Shrimp and Mango Tacos), The Cheesecake Factory (Core menu items: Chicken Mango and Avocado Salad and Thai Coconut Lime Chicken), Morrison Healthcare (LTO: Mango Toast), and Black Angus Steakhouse (Seasonal beverages: Jalisco Mango Mule, Coconut Mojito, Mango Lime Agua Fresca).

## MANGO INSPIRES AT FOOD EVENTS

The NMB presence at foodservice industry events in 2017 reached over 200 brands with fresh mango messaging. The NMB awarded four prizes for a foodservice recipe contest, gained fresh mango advocates and added recipes and images for PR pitching.

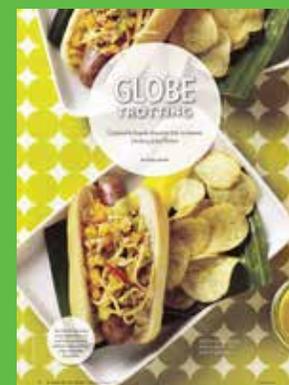
The team attended CAFÉ Leadership Conference, the Produce Marketing Association (PMA) Foodservice, MISE Hotel Chef Conference, IFEC and The Flavor Experience. At The Flavor Experience, there were 17 mango dishes on the menu, including 4 NMB recipes and 13 recipes created by other sponsors.



At the MISE show which attracted 85 hotel industry chefs, the NMB sponsored two dishes and inspired 11 additional mango dishes.

## MANGOS IN THE MEDIA

NMB recipes were featured in magazines such as Flavor & the Menu, Full Service Restaurant and Catering Magazine. There were over 10 million foodservice media impressions in 2017.



NMB recipe and photo, (Brat with Mango Kimchi and Mango Mustard) was featured as a full-page story about trending global flavors in the September/October 2017 Issue of Flavor & The Menu magazine.

# RETAIL MARKETING IMPACT

Key to the success of the NMB is the effort aimed at increasing presence and sell-through of mangos at retail.

## RETAIL PROMOTIONS

NMB funded retail promotions keep mangos top of mind for stores and consumers.

- 6,109 demo events
- 58,176 stores impacted
- 59% volume increase during NMB promotions



Creative mango display at Payson Market, winner in the 7+ registers category.

## RETAIL TOOLS

The NMB offered fun and easy ways to educate store associates and successfully drive mango sales.

- 5,420 bins shipped
- 3,909 POS kits shipped for the Mango Mania Display Contest

## MANGO MANIA DISPLAY CONTEST

The Mango Mania Display Contest is in its 6th consecutive year.

- Record breaking Mango Mania Display Contest with 182 entries, more than double the number of entries in 2016.
- 83% increase in mango volume among participating stores.



Mango bin highlights consumer/shopper educational messaging including mango nutrition info and how to store and how to cut visuals.

## RIPE AND READY TO EAT

The Ripe and Ready to Eat Program is in its 5th consecutive year and includes 11 retailers. Ripened mangos were available in roughly 7,000 stores nationwide.



NMB ripening expert works with Quality Control personnel to test mangos and create a practical protocol that will deliver ripe mango to consumers.



## MANGO UNIVERSITY

Mango University is in its 4th consecutive year. The program had 528 proud graduates in 2017! Training videos for store associates are now available in Spanish.

## RETAIL RD CHALLENGE

The NMB completed the 2nd year of the Retail RD Challenge, which had higher participation than 2016.



Retail RD, Diana Savani, hosted a demo event at a Hannaford supermarket.

## #MANGOMEETSTAJIN

### What a fruitful partnership with Tajín in 2017!

Together, the NMB and Tajín held the Mangos “Add a Zing with Tajín” Display Contest which included 110 partner demo events funded by Tajín. Tajín was also involved in a mango sponsored session at the Viva Fresh Produce Expo and sampling events at Maker Faire, and shared goodwill with #MangoMeetsTajin across social media.



- 1 & 2. #MangoMeetsTajin star in NMB and Tajín Social Media channels
3. Tajín boxes surround mango in this beautiful display at a Fiesta Mart store
4. Mango and Tajín are a winning combo in this display at Elrod's Cost Plus store
5. Tajín in-store demo event with mango samples

## MANGOS AT TRADESHOWS

The NMB team attended industry tradeshows and expos throughout the year, including Southern Exposure, Viva Fresh Produce Expo, New England Produce Council, PMA Fresh Summit Convention and the New York Produce Show. The team showcased mango education and promotion materials and connected with others in the produce industry, including importers, distributors and retailers, as well as other produce growers and brands. Relationships that develop because of these events are key to future strategic partnerships.



The NMB team at the New York Produce Show December 2017. Photo credit: Fresh Plaza

## NEW POS MATERIALS



New header card to educate consumers combines selection as well as ripening and cutting messages.



Backroom poster for critical mango education at the store level.

## MANGO RETAILER OF THE YEAR

The Mango Retailer of the Year recognizes retailers that go above and beyond in offering strong consistent support to the mango industry and deliver outstanding mango promotion results.



Michael Vessely (second from left) of Jewel-Osco was recognized as the 2017 Mango Retailer of the Year at the annual Mango Industry Reception at PMA's Fresh Summit Convention.

# RESEARCH AND INDUSTRY PROGRAMS

The Research Program supports two types of mango related research, nutrition & health and production & postharvest. Nutrition & health research propels the mango industry forward by highlighting nutrition benefits from mangos. Production & postharvest research provides a clearer understanding of how quality can be improved through better production, postharvest handling practices and food safety.

## NUTRITION & HEALTH

The NMB's Research and Industry department conducted outreach to ensure that new health information and best practices are shared throughout the mango supply chain, and continued to support breakthrough research.

## NUTRITION & HEALTH RESEARCH CONDUCTED

Four mango studies were presented at the Experimental Biology Conference to continue building on the "body of evidence" for the nutritional benefits of mangos. These studies were conducted by the Department of Nutrition and Food Science at Texas A&M University and the Department of Nutritional Science at Oklahoma State University. The studies investigated the impact of mango consumption on gut health, inflammation and metabolic activities.

- Chuo Fang, Ph.D., from Texas A&M University, investigated the metabolic effects of daily consumption of freshly frozen mango pulp (400g) for six weeks in lean and obese subjects and the relationship between mango metabolites to Body Mass Index and circulating biomarkers.
- Researcher Crystal O'Hara, Ph.D., from Oklahoma State University examined the post-prandial response of young, healthy males (18-25 years) following consumption of a typical American high-fat breakfast with or without a mango shake, which included 50g of mango pulp (equivalent to ~250g of fresh mango).
- In a randomized pilot study, researchers from Texas A&M University, led by Hyemee Kim, Ph.D., investigated the potential role of mango consumption in changes of the gut microbiota, bioavailability of galloyl metabolites, and anti-inflammatory activities in lean and obese subjects.
- Researchers from Texas A&M University examined the absorption, metabolism, and excretion of gallic acid, galloyl glycosides, and gallotannins in lean and obese individuals that consumed 400g of freshly frozen mango pulp daily for six weeks. The study's lead researcher, Susanne Mertens-Talcott, Ph.D. suggests that extended mango consumption may offer increased anti-inflammatory benefits compared to sporadic mango consumption and this would need to be confirmed within an extended efficacy study.



## HEALTH BENEFITS OF MANGO

In addition to research conducted, a comprehensive review of the available scientific literature on the health benefits of mangos was published in the May 2017 issue of Food & Function by Dr. Britt Burton-Freeman from the Center for Nutrition Research, Institute for Food Safety and Health, Illinois Institute of Technology.



*Vascular and Heart Health*

*Intestinal Health*



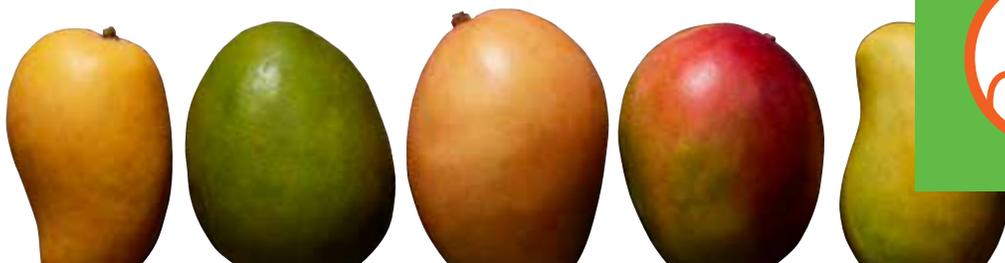
*Metabolic Health*



*Brain Health*



*Skin Health*



## PRODUCTION & POSTHARVEST

Every step of the mango supply chain represents an opportunity to improve quality which is a driver of mango sales and consumption. The NMB is committed to investing in areas of research which give a clearer understanding of how quality can be improved across the industry, from production all the way through to the hands of the consumer.

## PRODUCTION & POSTHARVEST RESEARCH CONDUCTED:

Providing high quality mangos that consumers will purchase again and again requires a commitment to safety and quality by each member of the mango industry. To continue sharing learnings and best practices in these key areas, the NMB funded several projects, these include:

- Mango tree response to different irrigation treatments at different phenological stages to maximize yield, reduce alternate bearing and increase water efficiency.
- Development and validation of techniques to modify the production of parthenocarpic fruits in Honey or Ataulfo mango.
- Validating ideal Control Atmospheres environmental conditions at 12.5°C to protect consumer quality of Hot Water Treated mangos.
- Use of biopesticides for the handling of anthracnose (*colletotrichum gloeosporioides*) on mangos.
- Development of mango packaging (5 and 10 down trays) and palletization towards improving fruit quality and transportation
- Validation of the heat units technique to determine the optimum harvest time on main exporting mango varieties.
- Overcoming limitations for processing riper mango fruit for fresh-cut mango.

In addition, the NMB conducted a supply chain monitoring and evaluation project for fresh-cut mangos, from the importer's warehouse to the grocery store in the U.S. The result is a Best Management Fresh-Cut Practices manual that is in the final review stages and will be distributed in 2018.

Food Safety research continues to be a priority to the mango industry. The NMB enlisted food safety expert Dr. Sergio Nieto-Montenegro from Food Safety Consulting and Training Solutions, LLC to facilitate three webinars. Topics included "Foreign Supplier Verification Program" for importers, and "Preventive Control" and "Produce Rule" for producers, packers, and exporters.



## PRODUCER EXTENSION PROGRAM

The Producer Extension Program is the NMB's educational outreach program in major mango producing regions, such as Mexico, Guatemala, Brazil, Ecuador and Peru.

The NMB conducted/sponsored nine extension meetings, reaching 2,756 attendees. Topics covered during the meetings were: the impact of climate change in mango production, food safety, high density mango production techniques, management of flowering, consumer attitudes and usage towards mango, fruit fly control and the main diseases affecting mango.



NMB team with researchers at a mango farm in Zacapa, Guatemala in December 2017



The National Mango Board is an agricultural research and promotion program authorized by the Research, and Information Act of 1996 (7 U.S.C. 7411-7425), and the Mango Promotion, Research, and Information Order, issued in 2004 (7 CFR 1206). The NMB is an instrumentality of the U.S. Department of Agriculture (USDA) and receives oversight from the Agricultural Marketing Service, Fruit & Vegetable Program, Research and Promotion Programs.



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