

# OPEN

## Up to Cans

CMI 2016 Sensory Science and Packaging Trends Research Report



# Summary

**Recently released research from Can Manufacturers Institute features data-fueled insights on:**

- Environmental factors and packaging assets that influence packaging strategies
- Consumer beverage and packaging sensory experiences and preferences
- Branding and other considerations driving the shift to aluminum beverage cans



# CMI: 2016 Research Study

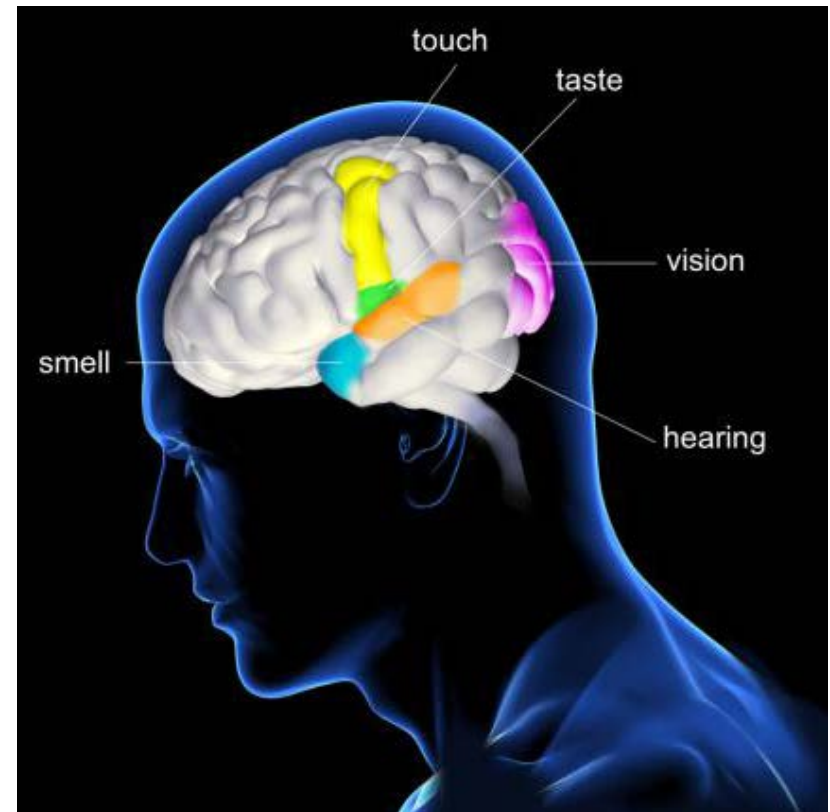
The following 2015 and 2016 research studies and sources include:

- CMI beverage sensory study
- CMI packaging usage and attitude survey
- Journal and news articles on sensory science
- Journal articles on beverage packaging performance
- Beverage industry data on product sales and packaging utilization

# **Data-fueled factors that influence packaging strategies**

# Packaging and environmental stimuli interact to affect food and beverage sensory qualities

- Different regions of the brain may use multiple inputs to perceive what the body senses about its environment.
- Eating and drinking are multi-sensorial activities—at least half of our experience with food and drink is determined by all five senses.
- Food and beverage perceptions and preferences are colored by more than just the product itself.



# Environmental colors, weight and texture affect the sensory perception and characterization of food

Strawberry  
Mousse



10%  
Sweeter



Yogurt



25% More  
Filling



+2.5 ozs



Coffee



2x as intense  
2/3 as sweet



Cookie






Harder,  
Crunchier







Rough Finish




# Even sound has an impact on sensory characterization across a range of foods and fragrances

Bittersweet Toffee	10% More Bitter	
	 Low Pitch Music	 Higher Pitch Music

Potato Chips	15% Fresher	
	 Louder, Higher Pitched Crunch	 Softer, Lower Pitched Crunch

Food & Drink	Sweet	Bitter
	<b>“B”</b> Words Starting with	<b>“K”</b> Words Starting with

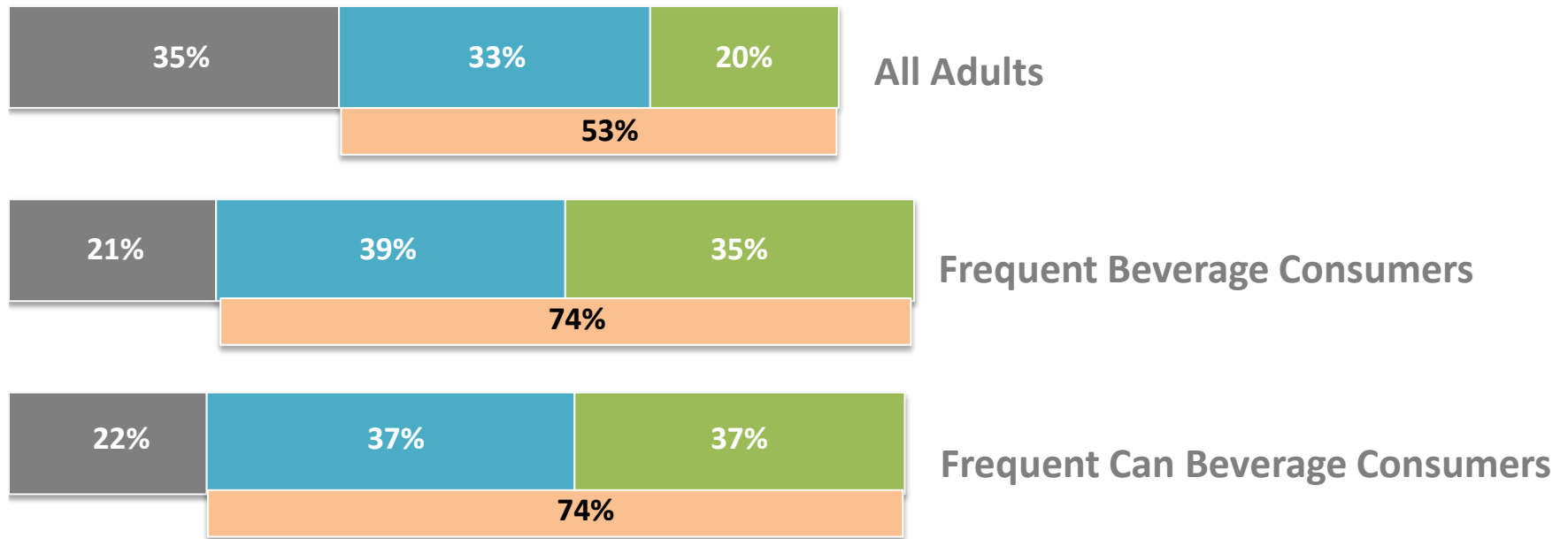
Deodorant Spray	Stronger, More Masculine	
	<b>“Ktsch-ch-ch”</b>	<b>“Psssst”</b>

# Consumer beverage and packaging preferences and sensory data



# Container plays an important role in beverage choice

## Importance of Package When Choosing a Beverage

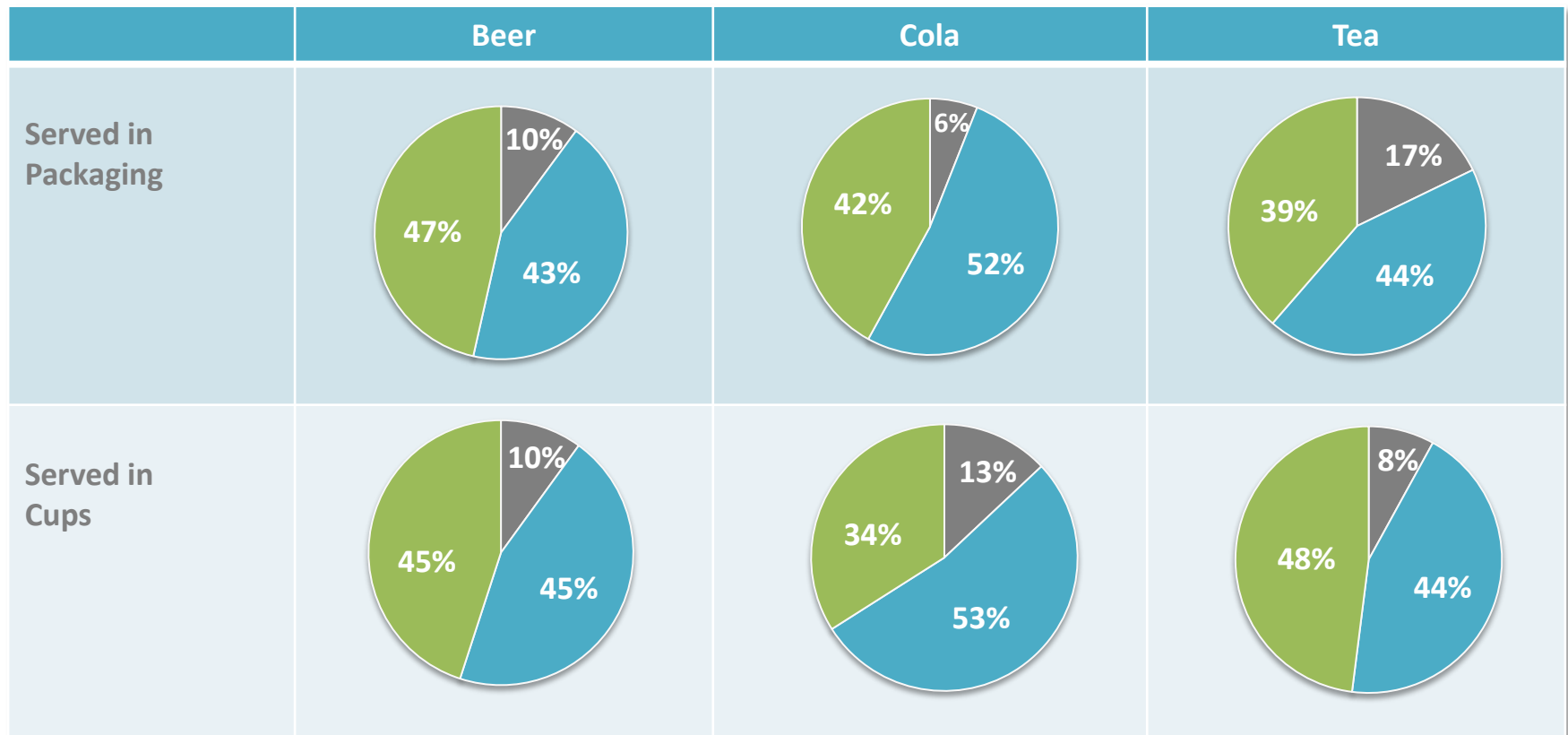


■ Somewhat ■ Very ■ Extremely

Q5 – How important is the container when choosing a beverage?  
Extremely, very, somewhat, not very, not at all important

# Whether consumed from a sample cup, can or bottle—beer, cola and RTD tea are equally preferred

## Preference for Beverage Served/Consumed from Package



 Cans  Bottles  No Preference

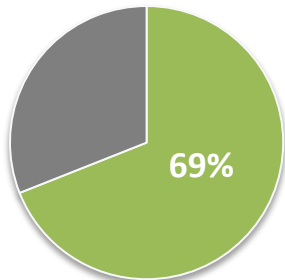
# Cans ENHANCE the taste experience



*"The feel of tea in a can is cool and metallic, on the lips and in the hand...it offers a cool burst of smoothness."*

*"Canned craft beer has a familiar aroma—you can smell different ingredients in the beer, like hops and barley."*

*"Canned soda feels cool when hitting the lips and the fizziness pops against your nose on that first sip."*



Relative to a plastic bottle, a chilled can of my favorite beverage feels colder and more refreshing.

# Qualitatively, consumers tell us that “cracking” a can signals transformation



*“The crackling noise when opening a can of tea marks the start of a happy, pleasurable experience ...happiness, peace, serenity and bliss.”*

*“Cracking the tab of the domestic canned beer is like a breath of fresh air after a long day.”*









*“The sound of opening a can ...hisses and crackles when you flip the tab—it’s a release of energy.”*

Preferred container for	Cans	Plastic Bottle
An energy boost	29%	24%
More alertness	28%	24%


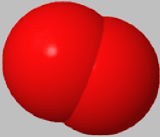



## The shift to aluminum beverage cans in select beverage categories

# Beverages with complex chemistries degrade due to exposure to light, oxygen and temperature

Literature suggests that there are three types of beverages that are particularly vulnerable to degradation as a function of exposure to light.

Beverage	Environmental factor	Packaging formats offer a range of protection	
 <b>Juices</b>	 <b>Oxygen</b>	Cans Multi-Layered Cartons High Density Polyethylene (HDPE) and Polypropylene (PP) plastic	<b>Higher level of protection</b> 
 <b>Milk</b>	 <b>Light</b>	Coated Paperboard Cartons Colored glass (brown, blue, green)	
 <b>Beer</b>	 <b>Temperature</b>	Clear PET Clear glass	<b>Lower level of protection</b>

# Beverage sensory chemistry is altered by light and oxygen

 <b>Juices</b>	 <b>Oxygen</b>	<ul style="list-style-type: none"><li>• Color, flavor and vitamin C level in juices</li><li>• Losses in vitamin C and formation of brown pigments and a loss of yellow pigments in orange juice</li><li>• Changes in aromatic profiles of juice due to degradation of limonene and the formation of <math>\alpha</math>-terpinol, an off-flavor</li></ul>
 <b>Milk</b>		<ul style="list-style-type: none"><li>• Light activation of riboflavin contributes to thiobarbituric (TBARS) off-flavor substances and decrease in riboflavin</li><li>• Noticeable level of TBARS can happen in 8 hours</li><li>• Milk light-induced off-flavors and odors described as burnt, scorched, and aftertaste flavors characterized as wet cardboard, metallic, or tallow</li></ul>
 <b>Beer</b>	 <b>Light</b>	<ul style="list-style-type: none"><li>• Hops iso-alpha acids converted by the ultra-violet wavelengths in light to free radicals</li><li>• Radicals bond with sulfur atoms to produce 3-methylbut-2-ene-1-thiol, or “skunky thiol”</li></ul>

# The sensory impact of light-damage on beer is not immediately noticed

- Triangle tests suggest consumers are not able to tell the difference between the majority of beers poured from a can or a bottle.
- The study investigated whether consumers could taste a difference between beer in aluminum cans and beer in glass bottles.
- The test was conducted with 125 untrained panelists sampling 14 different types of beer.
- Triangle tests only conducted to measure differences – no characterization or preference measures gathered.

Beer	Trials (N)	Successes	1-tailed p value	Sig.
Brand A	72	16	0.9857	NS
Brand B	72	22	0.731	NS
Brand C	72	27	0.2633	NS
Brand D	72	28	0.1899	NS
Brand E	72	29	0.1309	NS
Brand F	72	30	0.0862	NS
Brand G	72	30	0.0862	NS
Brand H	72	31	0.0541	NS
Brand I	72	31	0.0541	NS



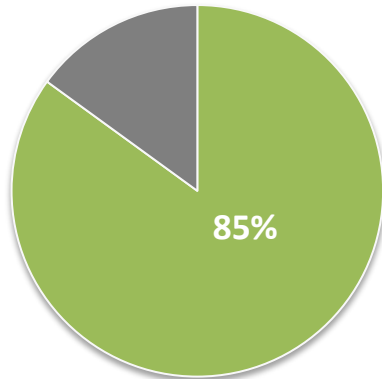
## However, noticeable differences are accentuated by age of beer and use of clear glass

- For the beers that were found to have a significant difference (see below), the difference in brewing dates of the cans and bottles had a significant positive correlation ( $R = 0.96$ )—as significance increased, the age of the product increased as well.
- The use of clear glass also led to a relatively high level of significance.
- Use of wheat as a brewing ingredient was also correlated—panelists could see color differences between these canned and bottled wheat beers.

Beer	Trials (N)	Successes	1-tailed p value	Sig.
Brand J	72	32	0.0324	S
Brand K	72	33	0.0184	S
Brand L	72	34	0.01	S
Brand M	72	34	0.01	S
Brand N	72	42	0	S

# Cans PROTECT the craft taste experience

Cans protect the unique cold, fresh, crisp flavors and carbonation that craft beer drinkers crave.



Cans effectively block out damaging effects of light, help preserve flavor and carbonation.

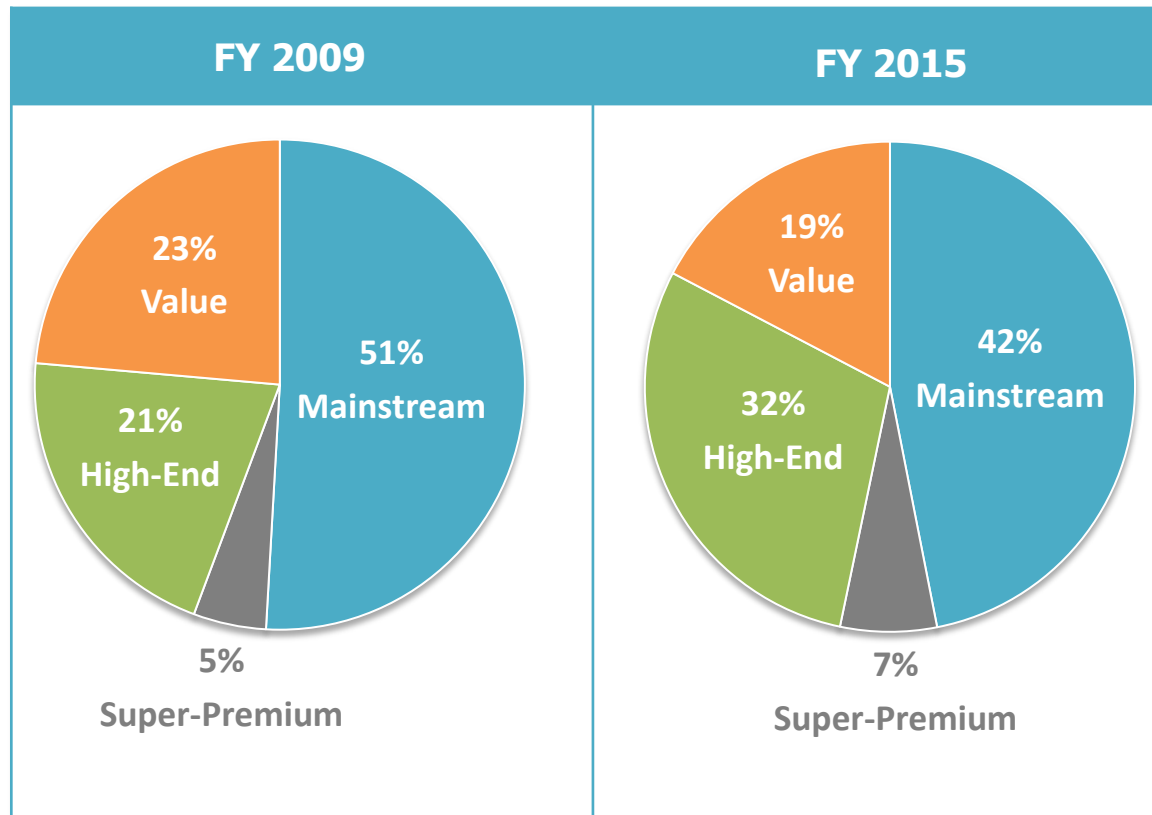
*"The aroma from canned craft beer is familiar—you can smell the different ingredients that make up beer, like hops and barley."*



*"Craft beer from a can is more crisp and refreshing than other containers."*

# Craft beer volume continues to increase as consumer interest grows in more complex flavors

U.S. Beer Market Share by Segment | 2009 vs. 2015



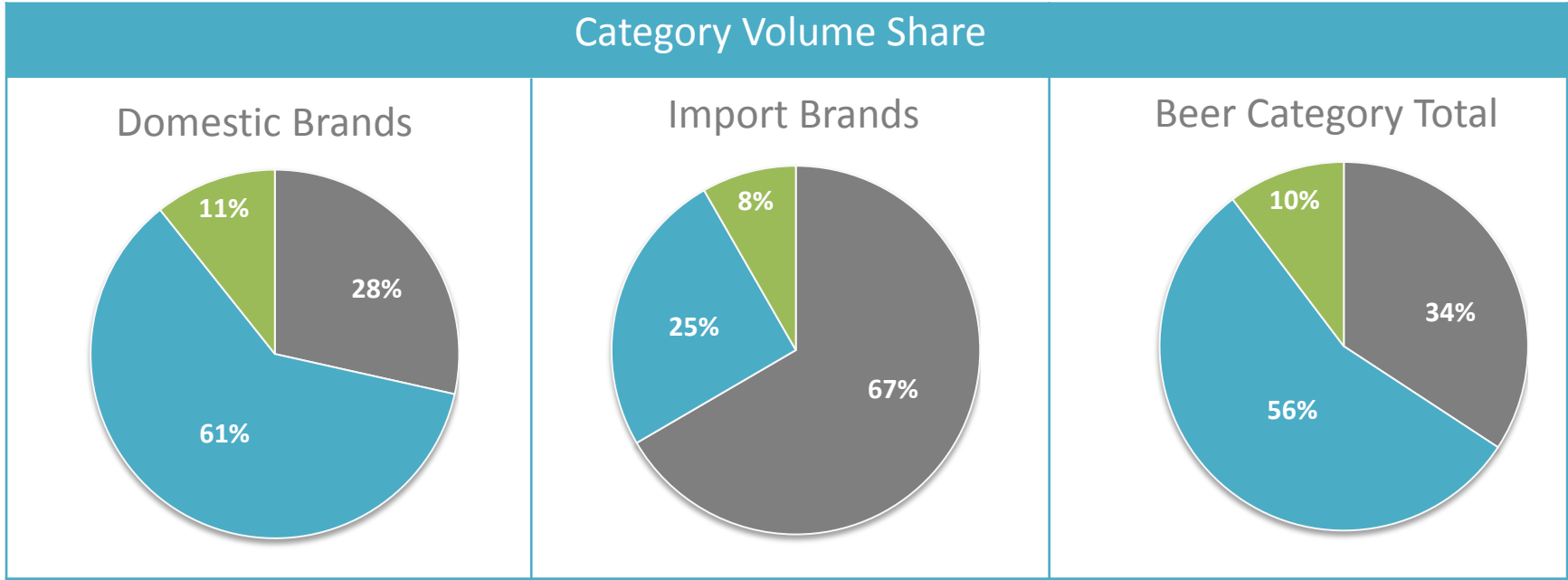
Segment	Point Change
Value Brands	-4.8
Mainstream	-8.5
Super-Premium	+2.1
High-End	+11.2



Craft Beer Segment  
'10 to '15 CAGR = +12.9%

Beer Category Shipments  
'14 to '15 = -0.2%

# Consistent with premiumization trend is cans' increased share of volume, especially in the higher value segment

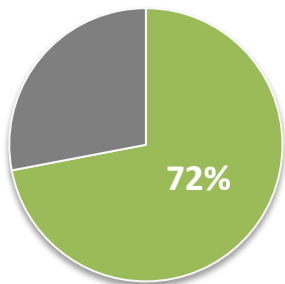


■ Glass Bottles ■ Aluminum Cans ■ Draft

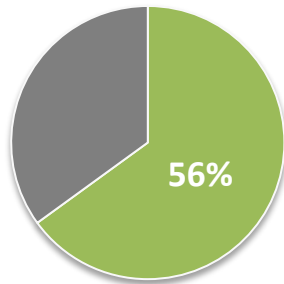
CY 2015	Percent Change Volume	Percent Change Volume	Percent Change Volume
Aluminum Cans	0.1%	16.5%	1.0%
Glass Bottles	-4.1%	2.8%	-2.2%

**External factors, other than sensory,  
impact the adoption of cans**

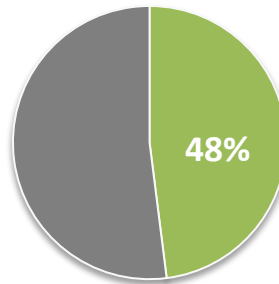
# Cans' 360° graphics sell brands



**"The unique shape and printing space on cans—images and designs catch my eye more than other beverage containers."**



**"I like canned packaging because the colorful labels completely cover the side of the package."**



**"I have tried a new type of beverage based on the way its container label and graphics look."**

*"Craft beer cans offer more creative labels because there is more real estate than on a bottle...they capture different aspects that delight the senses."*



*"The graphics on the cans of RTD tea are stylish and appealing."*

# Cans also fit key social need states



*“Canned energy drinks provide fuel and energy for exciting adventures or daunting tasks.”*

*“A can of beer is not ostentatious and avoids drawing unwanted attention.”*

*“Enhances a social setting and encourages friends and family to relax, let loose. Not pretentious but still creative and unique.”*

Need State	Cans	Bottles
Looks and feels familiar	40%	Glass 29%
Tailgating	38%	Plastic 26%
BBQ/Picnic	36%	Plastic 30%
Spending time at a friend's house	32%	Glass 27%

# CMI: 2016 Research Study

## Contact Information

If you have a question or would like more information on the research provided, give us a call or send an email and we'll be happy to help!

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