



## Consumer Attitudes and Interest Regarding In-Ovo Egg Sexing

July 2023



Photo by Raiyan Zakaria, Unsplash

REPORT PREPARED FOR



## Executive Summary

- In the United States, most egg buyers are unaware of the egg industry's practice of culling male chicks, are uncomfortable with it, and support finding alternatives.
- Only 11% of U.S. consumers know that culling male chicks immediately after they hatch is a common practice for the egg industry; 48% think male chicks are raised for meat.
- 61% of egg buyers are uncomfortable with the practice of "killing" male chicks while 21% are comfortable; 73% agree the egg industry should find an alternative.
- 81% of egg buyers are unaware of in-ovo egg sexing technology, but 64% agree the egg industry should adopt it instead of culling male chicks.
- 47% of consumers (about 122 million U.S. adults) are "extremely" or "very" interested in eggs produced using in-ovo sexing; another 35% (91 million) are "slightly" interested.
- 71% of egg buyers are willing to pay a premium for eggs produced using in-ovo sexing, including 55% who are willing to pay a premium of 36 cents or more per dozen eggs.
- From most to least important, better animal welfare, improving sustainability, cheaper production costs, and egg industry innovation are all important aspects for most egg buyers.
- The term "no-kill" clearly performed better than other potential terms for in-ovo egg sexing; terms including "cull" fell in the middle and terms including "sex" ranking lowest.
- Early adopters of eggs produced using in-ovo sexing are most likely to be affluent with more formal education, ages 25-44, from the Northeast, and frequent egg buyers.
- Early adopters are less likely to be from lower-income households, ages 18-24, Black or African American, from the Midwest, or infrequent egg buyers.

## Project Background

This research project was intended to help Innovate Animal Ag and its industry partners understand consumer awareness of and attitudes toward in-ovo egg sexing as a possible alternative to the industry practice of culling male chicks immediately after they hatch. This includes estimating the potential market demand for eggs produced using in-ovo sexing and identifying the likely early adopters.

The survey asked about respondents' egg purchase habits including frequency, volume, and types of specialty eggs they have purchased recently. It also assessed actual and self-reported awareness and level of comfort with culling male chicks immediately after they hatch. The survey then addressed awareness of and support for using in-ovo egg sexing as an alternative to culling male chicks, including their interest in and willingness to pay, as well as the most important aspects of in-ovo sexing and ways to describe the technology. The survey also asked a range of demographic questions, including gender, age, ethnicity, region, household income, education, and dietary status.

The survey included a subset of questions replicated from [a recent study](#) conducted by Michigan State University and funded by United Egg Producers and others. Similar to that study, we excluded people below age 18 and those who purchase less than half of their household’s groceries. We also used the same format for questions relating to egg purchase frequency and volume.

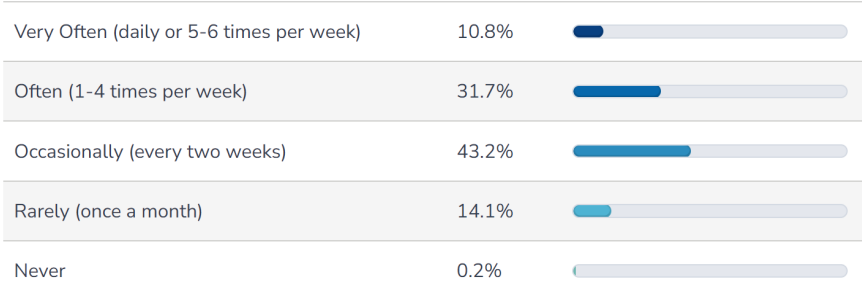
The survey was fielded from June 24 to July 2, 2023 with a sample size of 1,012 U.S. adults. Working with Nielsen Consumer Insights to source participants, Cultivate Insights made every effort to ensure high quality including disqualifying participants who failed simple attention checks or completed the survey too quickly. However, we should note that online sampling is not entirely representative of the U.S. population and that we are relying on self-reported data. Respondents’ answers may differ from their actual opinions or beliefs for reasons including social desirability bias, misunderstanding the questions, or not paying sufficient attention.

### Egg Purchasing Behavior

For U.S. consumers who purchase at least half of their household’s groceries (all respondents in our survey), egg purchases are very common. Essentially all respondents (98.5%) said they had purchased eggs in the three months prior to taking the survey. Of the 1.5% of consumers who have not, all of them said that they would have purchased eggs that “highly prioritize animal welfare and sustainability” in the past three months if they had been given the option.

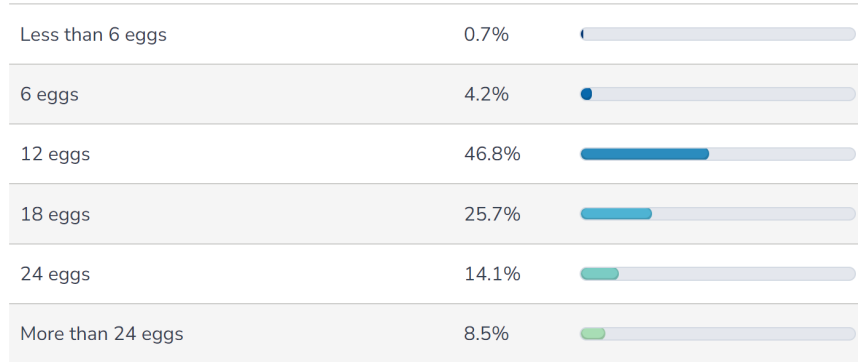
In addition to nearly all consumers buying eggs, U.S. consumers purchase eggs regularly. Most survey respondents said that they buy eggs “occasionally” (43%) or “often” (32%), which is roughly once every two weeks up to four times per week. By contrast, about one in ten consumers (11%) buy eggs “very often” and about one in seven consumers (14%) buy eggs “rarely.”

On average, how often do you purchase eggs?



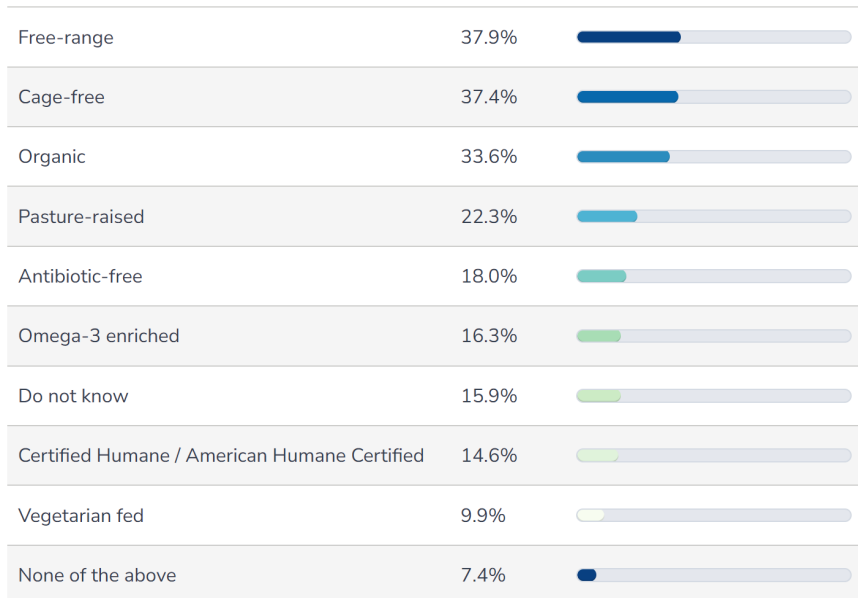
Underscoring the popularity of eggs among U.S. consumers is how many they usually buy when they visit the grocery store. Nearly half of survey respondents (47%) said they buy a dozen eggs when they go grocery shopping. Another quarter of consumers (26%) typically buy eighteen eggs, while one in seven (14%) buys two dozen eggs. About twice as many consumers said they purchase more than two dozen eggs (8.5%) compared to those who buy fewer than a dozen eggs (4.9%).

How many eggs do you typically buy when you go grocery shopping?



The survey also asked consumers which types of eggs they had purchased in the past three months, with an emphasis on different types of specialty eggs. A third or more of these consumers report having purchased “free-range” (38%), “cage-free” (37%), and/or “organic” (34%) eggs in that timeframe. Roughly one in five purchased “pasture-raised” (22%) and/or “antibiotic-free” (18%). All other egg types were purchased by fewer than one in five consumers and 7% of respondents said they had not purchased any of the specialty eggs listed.

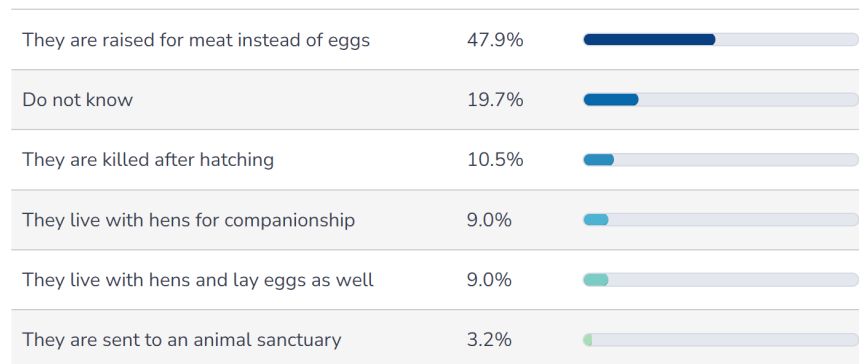
Which of the following kinds of eggs have you purchased in the past three months?  
Select all that apply.



## Awareness & Attitudes: Male Chick Culling

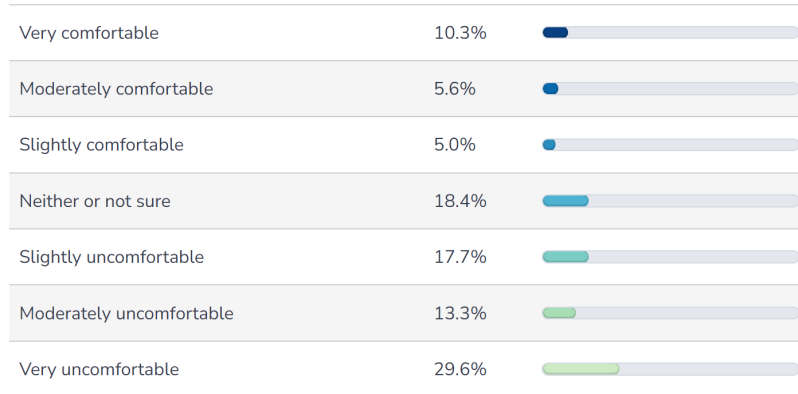
A key objective of this research project was to understand U.S. consumer awareness of and attitudes toward the egg industry’s practice of culling male chicks immediately after they hatch. The survey results show both low awareness of the practice and widespread misunderstanding of what happens to most male chicks in the egg industry. Specifically, nearly half of consumers (48%) incorrectly believe that male chicks produced by egg companies are raised for meat and another 20% said they do not know what happens. Nearly one in five (18%) said the male chicks continue to live with hens. Only about one in ten consumers (11%) answered correctly that male chicks are killed after hatching (in a follow-up question, 23% reported having known this prior to the survey).

The eggs that consumers eat were produced by a female hen on a farm. For every hen that is hatched to lay the eggs we eat, a male chick is also hatched. What do you think happens to these male chicks?



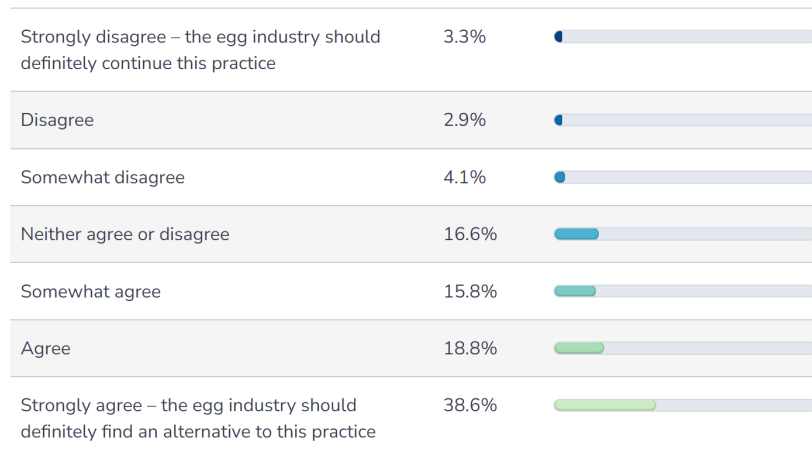
Most U.S. consumers (61%) feel “uncomfortable” about the egg industry’s practice of killing male chicks immediately after they hatch. This is nearly three times as many consumers who said they feel “comfortable” with the practice (21%). In fact, there are more consumers who said they feel “very uncomfortable” with the practice than there are consumers who feel “comfortable” at any level. Specifically, 30% of consumers feel “very uncomfortable,” 13% are “moderately uncomfortable,” and 18% are “slightly uncomfortable.” Nearly one in five consumers (18%) said they are neither comfortable nor uncomfortable with the practice of killing male chicks – or that they are not sure.

How comfortable or uncomfortable do you feel about the egg industry’s practice of killing male chicks immediately after they hatch?



While a clear majority of survey respondents said they are uncomfortable with the egg industry practice of killing male chicks immediately after they hatch, an even stronger majority thinks the egg industry should find an alternative. U.S. consumers are seven times more likely to agree than disagree with finding an alternative. Specifically, nearly three-fourths (73%) of consumers agree, including 39% who agree “strongly.” By contrast, only one in ten (10%) consumers disagrees, including 3% who disagree “strongly.” About one in six respondents (17%) did not agree or disagree.

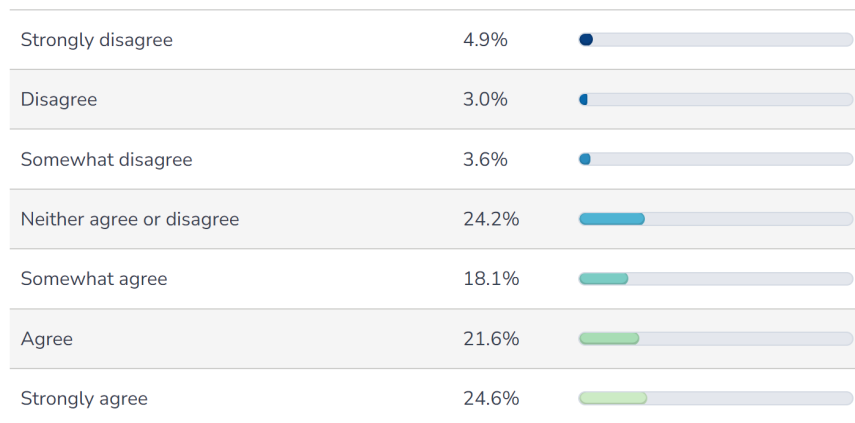
Do you agree or disagree that the egg industry should find an alternative to the practice of killing male chicks immediately after they hatch?



## Awareness & Attitudes: In-Ovo Egg Sexing

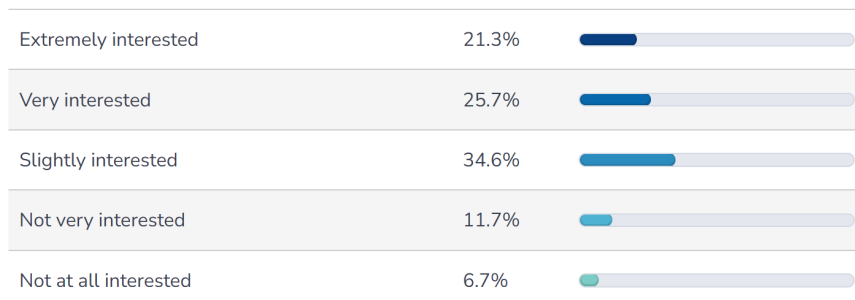
Another key objective of this research project was to understand U.S. consumer awareness of, interest in, and willingness to pay for eggs using in-ovo egg sexing to avoid killing male chicks. Again, the survey found that awareness is quite low, with about one in five consumers (19%) saying they were previously aware of this alternative to killing male chicks. U.S. consumers are nearly six times more likely to agree than disagree that the egg industry should adopt in-ovo egg sexing. Specifically, nearly two-thirds (64%) of consumers agree, including 25% who agree “strongly.” By contrast, about one in nine (12%) consumers disagrees, including 5% who disagree “strongly.” About one in four respondents (24%) did not agree or disagree, which may be related to questions about cost.

Do you agree or disagree that the egg industry should adopt in-ovo egg sexing to remove male eggs prior to hatching, instead of killing the chicks once they're born?



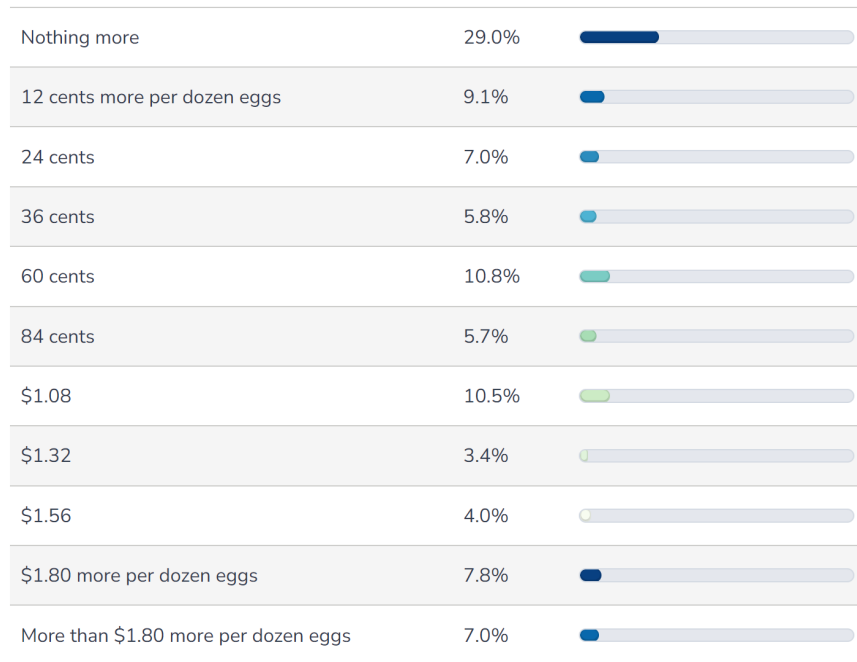
A very strong majority of U.S. consumers (82%) said they are interested in buying eggs produced using in-ovo sexing, although the level of that interest is somewhat mixed. One in five consumers (21%) is “extremely” interested, while one in four (26%) said they are “very” interested and another 35% are “slightly” interested in eggs produced using in-ovo sexing. Fewer than one in five U.S. consumers said they are relatively uninterested in these types of eggs, including 12% who are “not very” interested and 7% who are “not at all” interested.

If eggs using this new technology (in-ovo egg sexing) were available from your preferred grocery store, how interested would you be in buying them?



Survey results show that a solid majority of U.S. consumers (71%) are willing to pay at least a modest premium for eggs produced using in-ovo sexing technology. The weighted average price people will pay is 65 cents more per dozen eggs, or more than 5 cents per egg. Over half of consumers (55%) are willing to pay a premium of 36 cents or more per dozen eggs (three cents per egg). Three cents is also the estimated maximum cost per egg to implement in-ovo egg sexing, [according to Seleggt](#), a leading European supplier of the technology. A third of consumers (33%) are willing to pay a premium of \$1.08 or more per dozen eggs – or nine cents per egg. Nearly one in seven (15%) said they are willing to pay \$1.80 or more per dozen eggs, which translates to 15 cents (or more) per egg.

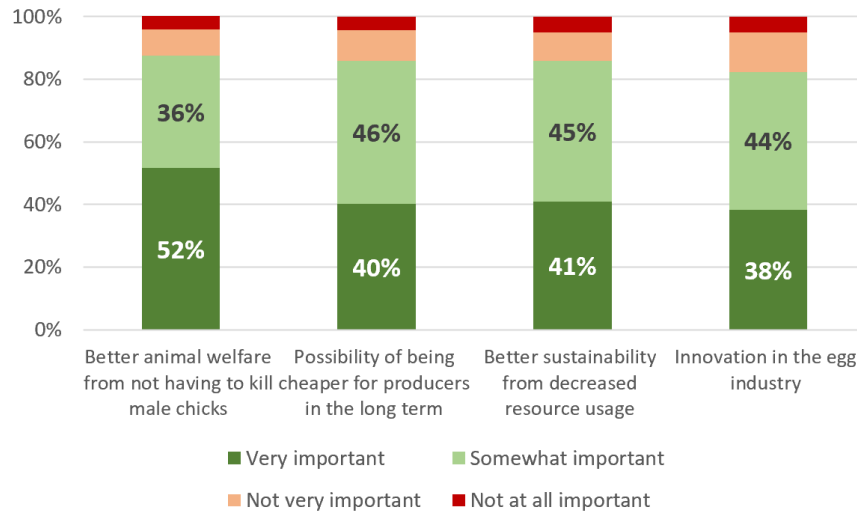
How much more would you be willing to pay for a dozen eggs (large, white, AA grade) if no male chicks were killed, due to the use of in-ovo egg sexing technology? Select the highest amount you would be willing to pay (in addition to what you already pay for a dozen eggs).



More than eight in ten U.S. consumers believe that all aspects of in-ovo egg sexing are at least “somewhat” important, with little differentiation. Better animal welfare is the most important aspect, by a relatively small margin, with 87% of consumers saying it is important (52% “very”). Better sustainability and the possibility of cheaper egg production were next, with 86% of consumers rating them important (40-41% “very”). While innovation in the egg industry was rated least important, 82% of U.S. consumers still believe this aspect of in-ovo sexing is important (38% “very”).

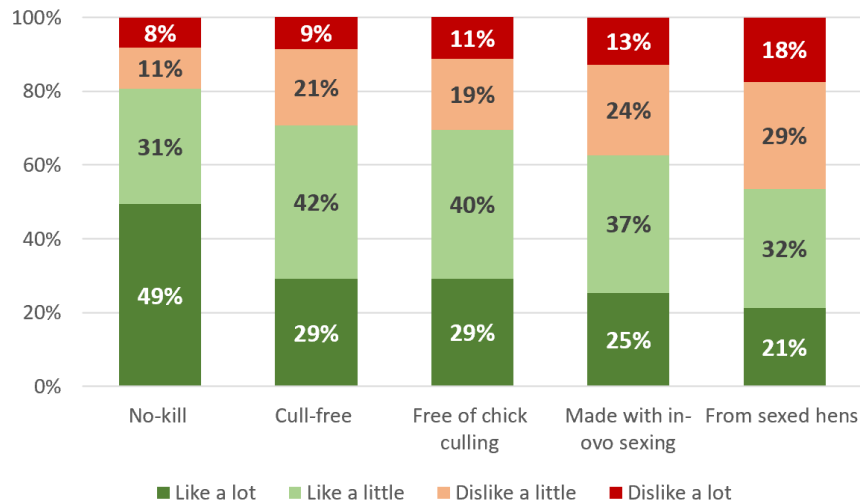


How important to you are each of the following aspects of in-ovo egg sexing?



Lastly, the survey asked U.S. consumers for their opinions of what to call in-ovo egg sexing technology and the results indicate a clear winner. More than four in five consumers (81%) like “No-kill,” including 49% who like it “a lot.” The terms “Cull-free” and “Free of chick culling” also performed well, with about seven in ten consumers liking them (and three in ten liking them “a lot”). “Made with in-ovo sexing” and “From sexed hens” were both rated lower than the other terms and more than a third of U.S. consumers said that they dislike these two phrases to describe in-ovo sexing.

How do you think eggs produced using this new technology (in-ovo egg sexing) should be referred to?  
Please rate each of the possible names below.



## Key Differences by Consumer Segment

A deeper analysis of survey results by segment shows that early adopters of eggs produced using in-ovo sexing technology are most likely to be affluent and have more formal education. They are more likely to be between the ages of 25 and 44, and particularly ages 35-44. Early adopters are more heavily concentrated in the Northeast region and are likely to be frequent egg buyers. They are slightly more likely to place importance on sustainability and egg industry innovation.

Following are some observations for key consumer segments.

- **Gender:** Twice as many men as women say that they are “comfortable” with the egg industry practice of killing male chicks immediately after they hatch. Overall agreement that the industry should find an alternative is comparable across genders, though women tend to agree more strongly. Men are actually slightly more interested than women in purchasing eggs produced using in-ovo sexing technology, but are slightly less willing to pay a premium. Men are less likely than women to be motivated by animal welfare.
- **Age:** Level of comfort with killing male chicks decreases with age, with older egg buyers being least comfortable with the practice. The same is true for agreeing that the industry should find an alternative. Interest in purchasing eggs produced using in-ovo sexing is strongest among those ages 25-44 and weakest among those ages 18-24, which may be due in part to a difference in purchasing power. However, willingness to pay a premium is strongest among 35-44 year-olds and weaker among older age groups.
- **Ethnicity:** White consumers are generally less comfortable with the practice of killing male chicks, while Black consumers are slightly more comfortable. Non-white egg buyers are also slightly less likely to agree that the industry should find an alternative. However, Black, Asian, and Latino consumers are slightly more willing to pay a premium compared to white consumers. White and Asian consumers are slightly more likely to think animal welfare is important, while Asian consumers are more likely to think that sustainability is important.
- **Region:** Egg buyers in the West and Midwest regions are generally more comfortable with killing male chicks, while those in the South are least comfortable with the practice. Those in the Midwest are least likely to agree that the industry should find an alternative, while those in the Northeast are most likely to agree. Interest in purchasing in-ovo sexed eggs is strongest in the Northeast and West. Willingness to pay a premium is lowest in the Midwest and highest in the Northeast. Consumers in the Northeast are also more likely to think that all benefits of in-ovo egg sexing are important.
- **Education and Household Income:** These two demographic variables tend to track closely with each other. Those with more formal education and higher incomes are more comfortable than others with the practice of killing male chicks. However, they are also more likely to agree that

the industry should find an alternative and/or adopt in-ovo egg sexing. Those with higher education/income are also more interested in purchasing eggs produced using in-ovo sexing and are substantially more willing to pay a premium. Those with higher income/education are also more likely to think sustainability is important, while those with lower income/education think all aspects of in-ovo sexed eggs are less important.

- **Egg Purchase Frequency:** While frequent egg buyers (those who buy eggs weekly or more often) are much more likely to say they are comfortable with the practice of killing male chicks, they are also more likely to agree that the industry should find an alternative. More importantly, they show substantially more interest in purchasing in-ovo sexed eggs and are willing to pay a considerably higher premium compared to less frequent egg buyers. Frequent egg buyers are also more likely than others to think that egg industry innovation and sustainability are important aspects of in-ovo egg sexing.

## Conclusions & Recommendations

### → The potential market for “no-kill” eggs is substantial.

At a price premium of three cents per egg, more than half of U.S. consumers who purchase half or more of their household’s groceries say they would buy eggs produced using in-ovo sexing technology. Some egg buyers may not follow through on those intentions, but the potential demand is still quite large. If producers can achieve a price premium of three cents per egg, which more than half of consumers say they are willing to pay, then we believe demand could eventually surpass that of the current cage-free market. The latter is currently [estimated by United Egg Producers](#) to be about one-third of eggs sold.

### → Consumers will need to be educated.

Eggs produced using in-ovo sexing technology may be more challenging to market to consumers than other specialty eggs. For example, “cage-free” eggs may have gained traction in part because consumers may understand that conventional production systems involve cages. Our results show that most egg buyers are unaware of the egg industry practice of culling male chicks and there will likely be a period of awareness-building in addition to product marketing.

### → Ethics-based marketing may have its limits.

Eggs produced using in-ovo sexing technology are most appealing to consumers for animal welfare reasons. However, from [other research](#) we know that major drivers of interest in specialty eggs (e.g., cage-free) are the perceived healthfulness and quality of those eggs. Without that motivation, eggs produced using in-ovo egg sexing will likely appeal primarily to ethics relating to animal welfare and sustainability. But these may be less compelling to many consumers than emphasizing health, product quality, and other factors.

→ **Cost remains a key driver for many egg consumers.**

Many egg buyers are value-driven. In our survey, nearly a third said they would not pay any premium for eggs produced using in-ovo sexing technology. Anecdotally, we know that egg buyers often look for sales or rebates and they regularly buy the least expensive option. However, we also know [from the USDA](#) that the average price premium for cage-free eggs is about eight cents per egg average difference (for the six weekly reports ending July 14, 2023). To grow market share beyond a niche segment of consumers, producers using in-ovo egg sexing will probably need to achieve a comparable (or lower) price premium.

→ **Terminology is important, but needs more research.**

Based on a single survey question about terminology, the phrase “no-kill eggs” was a clear winner with consumers, but there are many factors that might determine what terminology is most appropriate. In Europe, the industry appears to be gravitating toward “free of chick culling” as the preferred language, which may be an acceptable alternative to many U.S. consumers. However, we recommend that producers conduct additional research to identify the most effective language for marketing eggs produced using in-ovo sexing technology.

## Appendix: Respondent Profile

Working with Nielsen Consumer Insights, we surveyed a representative sample of online U.S. consumers. Actual representation may differ slightly given that we excluded people who do not purchase at least half of their household's groceries. Below is the overall profile of our survey respondents.

### GENDER

**51%** Female

**49%** Male

### AGE

**12%** 18-24

**23%** 25-34

**19%** 35-44

**14%** 45-54

**16%** 55-64

**16%** 65 or older

### EDUCATION

**27%** High school or less

**33%** Some college

**40%** Bachelor's degree or more

### GROCERY SHOPPING RESPONSIBILITY

**0%** Less than 25% (disqualified)

**0%** About 25% (disqualified)

**24%** About 50% (half)

**12%** About 75%

**64%** More than 75%

### ETHNICITY

**77%** White

**15%** Black

**4%** Asian

**17%** Latinx

### REGION

**23%** West

**22%** Midwest

**17%** Northeast

**38%** South

### HOUSEHOLD INCOME

**30%** Less than \$35k

**40%** \$35k to \$100k

**27%** More than \$100k

## Appendix: Survey Instrument

### Screener and Quota Questions

In what year were you born?

- Drop-down list with Before 1945; 1946-2005 (years listed individually); After 2005

DISQUALIFY anyone born after 2005 (under 18)

On average, how much of your household's groceries do you purchase?

- Less than 25%
- About 25%
- About 50% (half)
- About 75%
- More than 75%

DISQUALIFY anyone who buys less than half of their household's groceries.

Have you purchased eggs in the past three months?

- Yes
- No

IF NO, ask the question below. IF YES, skip the question below and proceed with the survey.

If you had the option to buy eggs that highly prioritize animal welfare and sustainability, would you have purchased them in the past three months?

- Yes
- No
- Not sure

IF YES, proceed with the survey. IF NO or NOT SURE, DISQUALIFY participant.

What is your gender?

- Female
- Male
- Non-binary / third gender
- Prefer to self-describe: \_\_\_\_\_
- Prefer not to say

Do you identify as Hispanic, Latino/Latina, or of Spanish descent?

- Yes
- No
- Prefer not to say

How would you describe yourself? Please select all that apply.

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Middle Eastern or North African
- Other / Not represented above
- Prefer not to say

Allow multiple selections.

In which state do you currently live? If you spend time in multiple places, provide the state where you spend the most time.

- [\[List of states plus District of Columbia and Puerto Rico\]](#)

### Survey Questions

On average, how often do you purchase eggs?

- Very Often (daily or 5-6 times per week)
- Often (1-4 times per week)
- Occasionally (every two weeks)
- Rarely (once a month)
- Never

How many eggs do you typically buy when you go grocery shopping?

- Less than 6 eggs
- 6 eggs
- 12 eggs
- 18 eggs
- 24 eggs
- More than 24 eggs

Which of the following kinds of eggs have you purchased in the past three months? Select all that apply.

- Cage-free
- Vegetarian fed
- Antibiotic-free
- Omega-3 enriched
- Free-range
- Certified Humane / American Humane Certified
- Organic
- Pasture-raised
- Other. Please specify: \_\_\_\_\_
- Do not know
- None of the above

Randomize order of answer options, anchoring “Other” and “Do not know” and “None” at bottom, and allow multiple selections.

The eggs that consumers eat were produced by a female hen on a farm. For every hen that is hatched to lay the eggs we eat, a male chick is also hatched. What do you think happens to these male chicks?

- They are killed after hatching
- They are raised for meat instead of eggs
- They live with hens for companionship
- They live with hens and lay eggs as well
- They are sent to an animal sanctuary
- Other. Please specify: \_\_\_\_\_
- Do not know

Randomize order of answer options, anchoring bottom two.

It is true that for each hen that lays the eggs we eat, a male chick is also hatched. These male chicks cannot lay eggs and are unsuitable for meat production because the breeds of chicken used in the egg and meat industries are different. The male chicks are therefore killed immediately after they hatch.

Prior to taking this survey, were you aware that most male chicks in the egg industry are killed immediately after they hatch?

- Yes
- No

How comfortable or uncomfortable do you feel about the egg industry’s practice of killing male chicks immediately after they hatch?

- Very comfortable
- Moderately comfortable
- Slightly comfortable
- Neither or not sure
- Slightly uncomfortable
- Moderately uncomfortable
- Very uncomfortable

Do you agree or disagree that the egg industry should find an alternative to the practice of killing male chicks immediately after they hatch?

- Strongly disagree – the egg industry should definitely continue this practice
- Disagree
- Somewhat disagree
- Neither agree or disagree
- Somewhat agree
- Agree
- Strongly agree – the egg industry should definitely find an alternative to this practice



A new technology could provide an alternative to the practice of killing male chicks. **In-ovo egg sexing** enables the early identification of male eggs, allowing them to be removed before they hatch. With this technology, only females are hatched, addressing animal welfare concerns and increasing sustainability by saving resources.

Prior to taking this survey, were you aware that in-ovo egg sexing could be used to remove male eggs prior to hatching, instead of killing the chicks once they're born?

- Yes
- No

Do you agree or disagree that the egg industry should adopt in-ovo egg sexing to remove male eggs prior to hatching, instead of killing the chicks once they're born?

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree or disagree
- Somewhat agree
- Agree
- Strongly agree

If eggs using this new technology (in-ovo egg sexing) were available from your preferred grocery store, how interested would you be in buying them?

- Extremely interested
- Very interested
- Slightly interested
- Not very interested
- Not at all interested

How much more would you be willing to pay for a **dozen eggs** (large, white, AA grade) if no male chicks were killed, due to the use of in-ovo egg sexing technology? Select the **highest amount** you would be willing to pay (in addition to what you already pay for a dozen eggs).

- Nothing more
- 12 cents more per dozen eggs
- 24 cents
- 36 cents
- 60 cents
- 84 cents
- \$1.08
- \$1.32
- \$1.56
- \$1.80 more per dozen eggs
- More than \$1.80 more per dozen eggs

How important to you are each of the following aspects of in-ovo egg sexing?

- Better animal welfare from not having to kill male chicks
- Better sustainability from decreased resource usage
- Innovation in the egg industry
- Possibility of being cheaper for producers in the long term
- *Scale: Very important; Somewhat important; Not very important; Not at all important*

Randomize order of answer options.

How do you think eggs produced using this new technology (in-ovo egg sexing) should be referred to? Please rate each of the possible names below.

- Cull-free
- From sexed hens
- Free of chick culling
- No-kill
- Made with in-ovo sexing
- *Scale: Like a lot; Like a little; Dislike a little; Dislike a lot*

Randomize order of answer options.

### **Additional Demographic Questions**

What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree
- High school graduate (diploma or equivalent including GED)
- Some college but no degree
- Associate degree in college (2-year)
- Bachelor's degree in college (4-year)
- Master's degree
- Doctoral degree
- Professional degree (JD, MD, etc.)
- Prefer not to say

What is your total household income going to be for this entire year (2023)? Please give your best estimate.

- Less than \$10,000
- \$10,000 to \$14,999
- \$15,000 to \$24,999
- \$25,000 to \$34,999
- \$35,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 to \$149,999
- \$150,000 to \$199,999
- \$200,000 or more
- Prefer not to say