



# 2020 State of the U.S. Artisan/Specialty Cheese Industry Food Safety Report

The American Cheese Society  
commissioned the  
University of Missouri  
to conduct this study.

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# Acknowledgements

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This project would not have been possible without the participation of cheesemakers. For each of the three surveys conducted to date (2016, 2018, and 2020), an average of 204 cheesemaker-respondents have taken the time to respond to survey questions. Their participation benefits the entire artisan, farmstead, and specialty cheese industry in that the data provided by these cheesemaker-respondents (hereinafter referred to as “cheesemakers”) can then be used to identify trends and insights for use by industry advocates.

The project was also made possible through the support of the American Cheese Foundation.

We hope that industry members will find the information presented in this report to be useful, and that it can provide some support in operating cheese businesses sustainably and profitably.

Researchers from the University of Missouri collected and analyzed the 2018 and 2020 survey data and developed this benchmarking report. University of Connecticut researchers developed and conducted the 2016 survey and analyzed the data.

# Executive Summary

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This report presents a summary of food safety-related findings identified through survey responses provided by U.S. artisan, farmstead, and specialty cheesemakers. Key findings from the 2020 survey include:

- 85% of cheesemakers used pasteurized milk to make cheese (up from 75% in 2018); 35% used unpasteurized milk with no heat treatment (down from 50% in 2018); and 16% used unpasteurized milk with some heat treatment (consistent with 17% in 2018).
- Cheesemakers most commonly noted aging cheese from 60 days to 89 days and from 180 days to 269 days with 42% noting that they age cheese for these time ranges. Cheesemakers were less likely to age cheese for less than 60 days although cheesemakers aging cheese for this period aged an average of 61% of their cheese for less than 60 days.
- 88% of cheesemakers reported having a current food safety plan in place at the time they responded to the survey, up from 82% in the 2018 report and 59% in the 2016 report.
- Cheesemakers who are ACS members are more likely to have a written food safety plan in place. In 2016, 72% of members indicated they had a plan compared with 89% in 2018 and 98% in 2020.
- 91% of cheesemakers producing less than 5,000 pounds of cheese per year had a food safety plan. However, 29% of cheesemaking business producing between 5,001 and 10,000 pounds of cheese per year did not have a plan in place. All cheesemakers producing more than 50,000 pounds per year reported having a food safety plan.
- 69% of cheesemakers reported that they conducted microbial testing, up from 59% in 2018. In addition, cheesemakers reported a higher frequency of microbial testing than they did in 2018.
- Use of pathogen testing has increased from 2016 to 2018 and to 2020. In 2020, 61% of cheesemakers reported that they conducted pathogen testing, compared with 45% of cheesemakers in 2018 and 39% in 2016.
- 70% of cheesemakers reported that they had previously had an FDA audit or inspection.
- Of the cheesemakers surveyed, 61% reported seeking third-party advice regarding food safety practices in the previous three years. 74% of these cheesemakers reported seeking this advice from another cheesemaker.

# Introduction

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## Survey Background

The inaugural State of the U.S. Artisan/Specialty Cheese Industry survey was conducted in 2016 to support cheesemakers and their businesses through the provision of much-needed information about the artisan, farmstead, and specialty cheese industry. Using the information presented in these reports, cheesemakers may be able to assess how their businesses have performed relative to the businesses of other producers making artisan, farmstead, and specialty cheese. The 2020 survey is the third survey and shares the latest insights about this unique segment of the cheese industry. The American Cheese Education Foundation has supported all three surveys.

## Who We Are

The American Cheese Society (ACS) is the leader in promoting and supporting American cheeses, providing the cheese industry with educational resources and networking opportunities, while encouraging the highest standards of cheesemaking focused on safety and sustainability.

## Definitions

There are no legal or regulatory distinctions of “artisan,” “farmstead,” or “specialty” cheeses. The following definitions are used by the American Cheese Society:

### Artisan Cheese

The cheese is produced primarily by hand, in small batches, with particular attention paid to the tradition of the cheesemaker’s art, and thus using as little mechanization as possible in the production of the cheese.

### Farmstead Cheese

The cheese must be primarily made by hand with milk from the farmer’s own herd, or flock, on the farm where the animals are raised. Milk used in the production of farmstead cheeses may not be obtained from any outside source. Care and attention must be paid to the purity, quality, and flavor of the milk. The cheese must be ripened naturally, with emphasis on the development of characteristic flavor and texture and without the use of shortcuts and techniques to increase yield and shelf life at the expense of quality. Respect for the traditions and history of cheesemaking are expected regardless of the size of the production.

## Specialty Cheese

Specialty cheese is defined as a cheese of limited production, with particular attention paid to natural flavor and texture profiles.

## Commodity Cheese

Cheese that's produced in large volume using industrial manufacturing techniques such as milk standardization, mechanization, and automation and that's often used in private labeling, food service, mass retail, or institutional settings. Responses from commodity cheesemakers were included in the data analysis if those cheesemakers also produced artisan, farmstead, or specialty cheese.

## Cheesemaker

Any producer of cheese in the United States whose production meets the above definition(s).

## About the Survey

The first artisan, farmstead, and specialty cheese industry survey was conducted for ACS in 2016 by researchers at the University of Connecticut. A total of 897 cheesemakers were invited to participate, and 216 participant responses were analyzed. The results of this first study were published in 2017 and emphasized the value of gathering operational data in order to better describe the scope and scale of the growing American artisan, farmstead, and specialty cheese industry.

The American Cheese Society engaged researchers at the University of Missouri to conduct a second study in 2018. For the survey conducted in 2018, an attempt was made by researchers at the University of Missouri to create an exhaustive list of all artisan, farmstead, and specialty cheesemakers within the U.S. who were in business in 2017. Google searches resulted in 978 U.S. artisan, farmstead, and specialty cheesemakers who were invited to participate in the survey by postal mail. Responses from 209 participants were received. Responses from five participants were excluded from the analysis as those five producers exclusively made commodity cheese. Thus, the final sample included 204 participants. The response rate was deemed statistically reliable with 95.5% confidence. In 2018, participation requests were made by: university researchers; ACS; state and local cheese guilds; and during the ACS Annual Conference in July 2018, where ACS and University of Missouri personnel promoted the survey.

Researchers at the University of Missouri have again conducted this third study in 2020. The 2020 survey did not involve sending out invites by post, and the list was updated with careful attention paid to eliminating both those cheesemakers who had advised they were no longer

operating, and cheesemakers without a valid e-mail address. As a result, for the 2020 survey, 762 U.S. artisan, farmstead, and specialty cheesemakers were invited to participate in the survey. Responses from 191 participants were received. The response rate was deemed statistically reliable with 95.5% confidence. In 2020, participation requests were made by university researchers; ACS; and state and local cheese guilds. The ACS Annual Conference was not held in 2020 due to COVID-19.

Participation in all three studies was voluntary.

The 2020 survey consisted of 65 questions about the following topics:

- Production (14 questions),
- Marketing (6 questions),
- Food safety (19 questions),
- Demographics (15 questions),
- Industry participation (9 questions), and
- Outlook and attitudes (2 questions).

Not all questions were answered by all participants. In some cases, questions weren't relevant for a particular participant based on his or her previous answers to a question, or participants may have chosen not to answer some questions.

In some cases, this report shares multiyear data collected in the 2016, 2018, and 2020 surveys. To answer some survey questions, cheesemakers recorded information about their operations in the 2015, 2017, and 2019 calendar years, while to answer other questions, cheesemakers provided responses to reflect their current attitudes and experiences. As a result, the multiyear data presented in the report may be labeled as "2015, 2017, and 2019," or "2016, 2018, and 2020," depending on the structure of the question and time period that the data represent.

## **Benefits of Participation**

Cheesemakers who participated in the 2020 survey will be provided with electronic of this food safety report, the benchmarking report, and the key findings report. In addition, all respondents were entered into a drawing in which five cheesemakers received their choice of a complimentary American Cheese Society conference registration or a Small Business Level 1 American Cheese Society membership (valued at \$225).

## Goals and Processes

The U.S. artisan, farmstead, and specialty cheese industry is growing, and consumers have increasing interest in these unique cheese products. However, challenges such as maintaining profitability in light of rising costs are also present.

This report provides insights into management practices that may provide opportunities for cheesemakers to achieve higher margins. Examples include reducing the number of products sold or the number of distribution channels employed.

Statistical significance was an essential part of this study. Only relationships between variables that were found to be statistically significant — and not due to chance — are included in this report.

## Allowing Fair Comparisons

Due to the differences among the businesses that participated in this study, it is important to discuss how data were compared. Throughout this report, cheesemakers who produced no more than 750,000 pounds of cheese in 2019 may be referenced in order to compare their characteristics. Cheesemakers who produced more than 750,000 pounds accounted for 10% of all respondents. In comparison, 68% of respondents produced 50,000 pounds or less in 2019. In some cases, including the cheesemakers who produced more than 750,000 pounds in comparisons resulted in high averages which did not provide a true picture of the majority (90%) of cheesemakers. This report denotes instances where averages for all cheesemakers may have skewed the analysis, and in such cases, the discussion focuses on cheesemakers who produced no more than 750,000 pounds of cheese.

## Confidentiality

This benchmarking report contains results obtained from aggregated data. Thereby, it protects the confidentiality of all cheesemakers participating in the surveys. All raw data provided to ACS lack any information that could be used to identify a single producer.



# Milk Type

In 2019, 85% of cheesemakers used pasteurized milk to make cheese, establishing a trend in the increase of cheesemakers using this milk type. See Exhibit 1.1. There was a decrease in the percentage of cheesemakers reporting the use of unpasteurized milk with no heat treatment (hereafter referred to as “raw”) in their

cheesemaking: 35% in 2019 compared to 50% in 2017. The percentage of cheesemakers using unpasteurized milk with some heat treatment (hereafter referred to as “thermized”) stayed relatively constant between 2017 and 2019. Some

cheesemakers used more than one type of milk in their cheese production. For example, of the cheesemakers who used pasteurized milk, 35% also used some form of unpasteurized milk. This is down from the 2017 figure of 48%.

Of the cheesemakers who used unpasteurized milk with no heat treatment, 24% used only this type of milk, meaning they didn’t use any pasteurized or thermized milk. Again this is down from the

Exhibit 1.1 — Share of Cheesemakers Using Raw vs. Pasteurized Milk

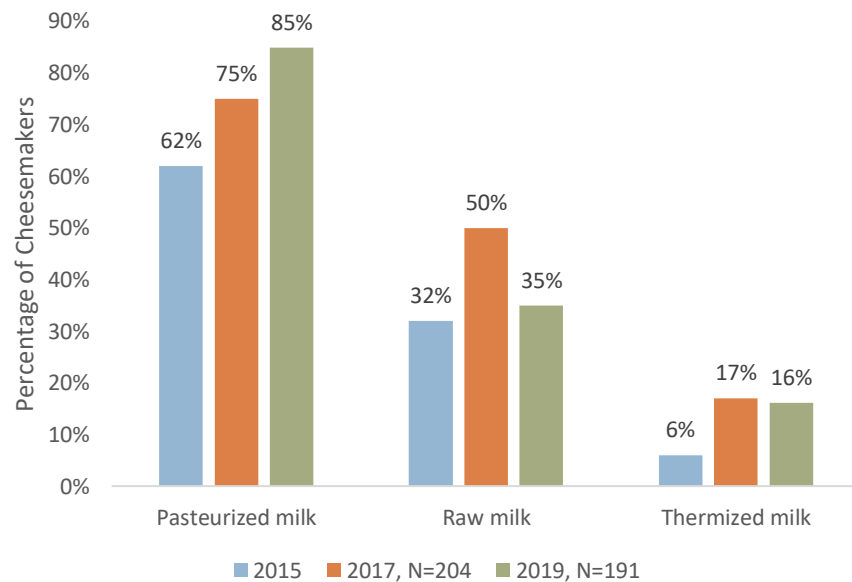
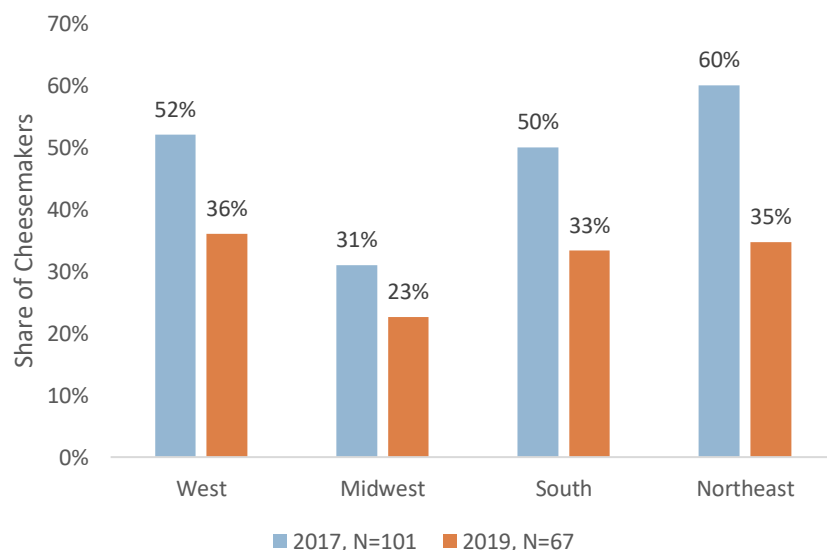


Exhibit 1.2 — Geographical Location of Cheesemakers Using Raw Milk

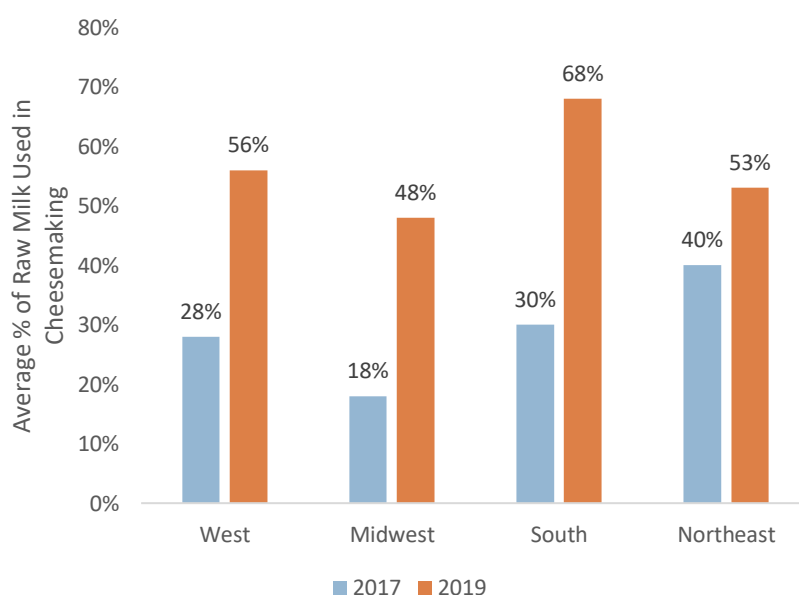


2017 figure of 32%. Among cheesemakers who used at least some thermized milk, 41% of the milk they used for cheesemaking was thermized. This figure stayed relatively constant (42% in 2017) and indicates that this group of cheesemakers also produced cheese with pasteurized milk or raw milk.

Exhibit 1.2 shows that while cheesemakers using raw milk were more likely to be located in the Northeast in 2017, respondents reporting the use of raw milk in 2019 were somewhat evenly spread between the West, South, and Northeast. The Midwest had the fewest percentage of cheesemakers using raw milk in both 2017 and 2019.

While the number of cheesemakers reporting the use of raw milk decreased between 2017 and 2019, those cheesemakers using this type of milk reported using more of it in their cheesemaking than in 2017. See Exhibit 1.3. Cheesemakers in the South used a higher percentage of raw milk in their cheesemaking in 2019 than did cheesemakers in other regions, reporting an

Exhibit 1.3 — Average % of Raw Milk Used in Cheesemaking by Region

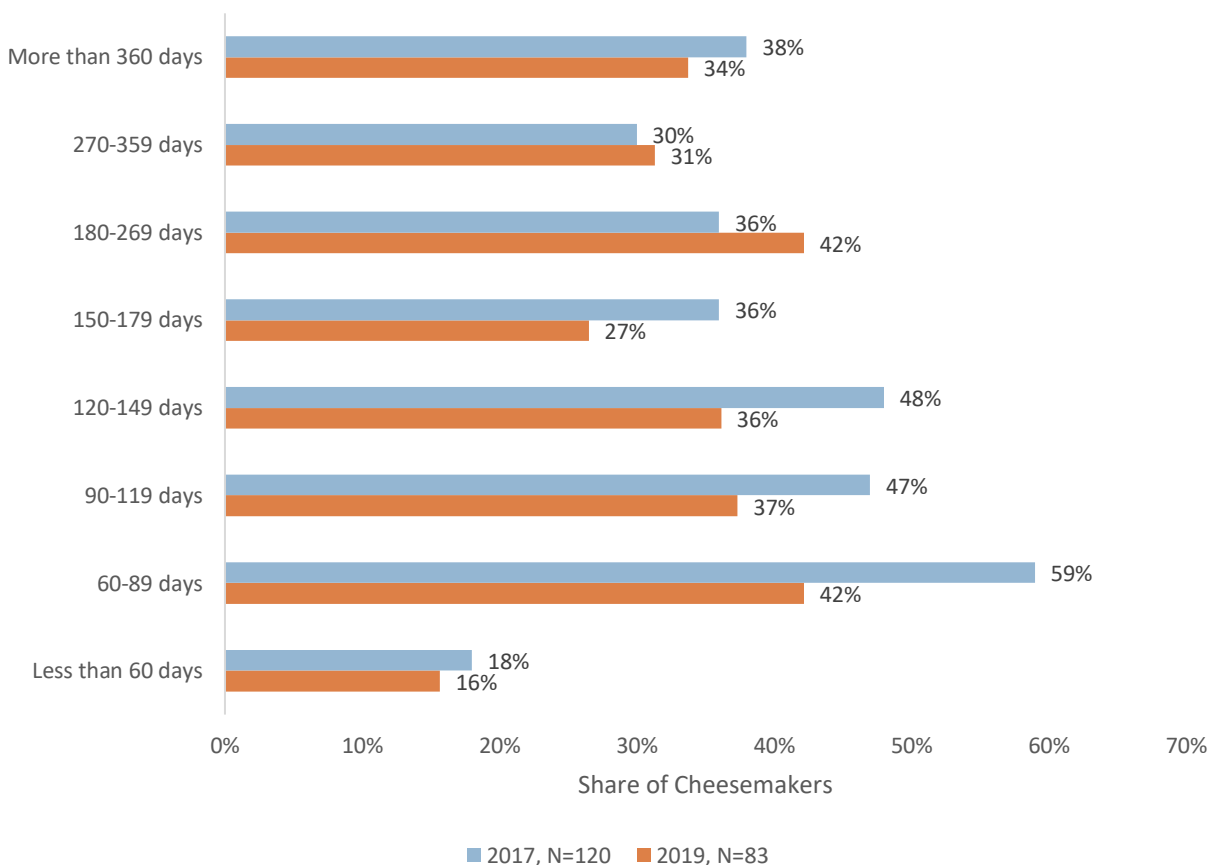


increase from an average 30% of the milk being used in cheesemaking being raw in 2017 to 68% in 2019. The West and Midwest regions had similarly high increases. The average percentage of raw milk used in the West increased from 28% in 2017 to 56% in 2019, and in the Midwest, the increase was from 18% in 2017 to 48% in 2019. In 2017 the Northeast region reported the highest average use of raw milk in cheesemaking, however in 2019 there was less of an increase in this region than any other region.

# Aging

In 2019, cheesemakers most commonly noted aging cheese from 60 days to 89 days and from 180 days to 269 days; 42% of cheesemakers noted aging cheese for both these lengths of time as indicated by the orange bars in Exhibit 2.1. Cheesemakers were least likely to age cheese for less than 60 days in both 2017 and 2019. More respondents reported aging cheese for between 180 and 269 days, and between 270 and 359 days in 2019 than they did in 2017 however in most categories there was a decrease in the number of respondents reporting aging cheese.

Exhibit 2.1 — Share of Cheesemakers Aging Cheese by Days



While there was a general decrease in the number of respondents indicating that they aged cheese, the share of cheese being aged by cheesemakers increased in nearly every category compared to 2017. Exhibit 2.2 indicates the average share of cheese that cheesemakers aged for a certain number of days in 2017 and 2019. For example, though only 16% of cheesemakers reported aging cheese for less than 60 days, on average, in 2019, those cheesemakers who did age cheese for that period of time tended to age an average of 61% of their cheese for less than

60 days. This is an increase over the 2017 figure reported by cheesemakers being an average of 53% of their cheese aged for less than 60 days. Among the cheesemakers who reported aging cheese for more than 360 days, they tended to age, on average, 36% of their cheese for this amount of time in 2019 compared to 30% in 2017.

**Exhibit 2.2 — Share of Total Cheese Production Aged**

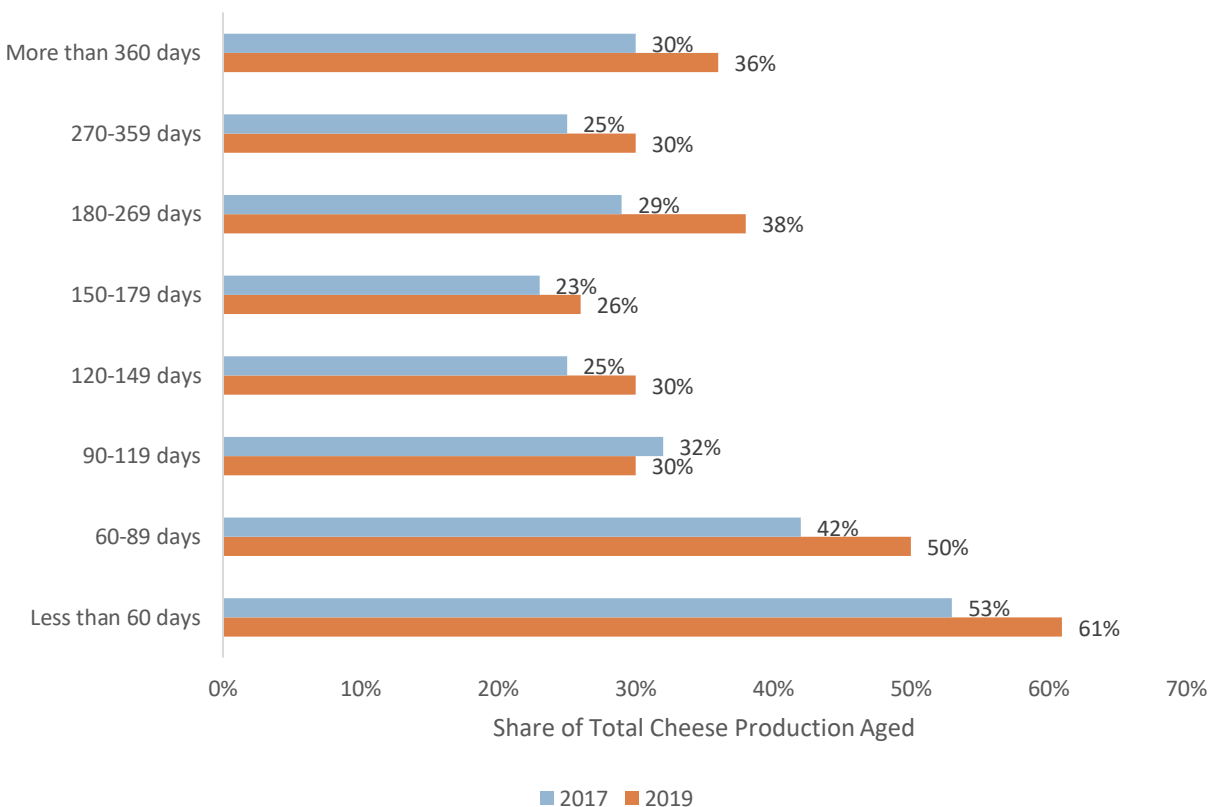
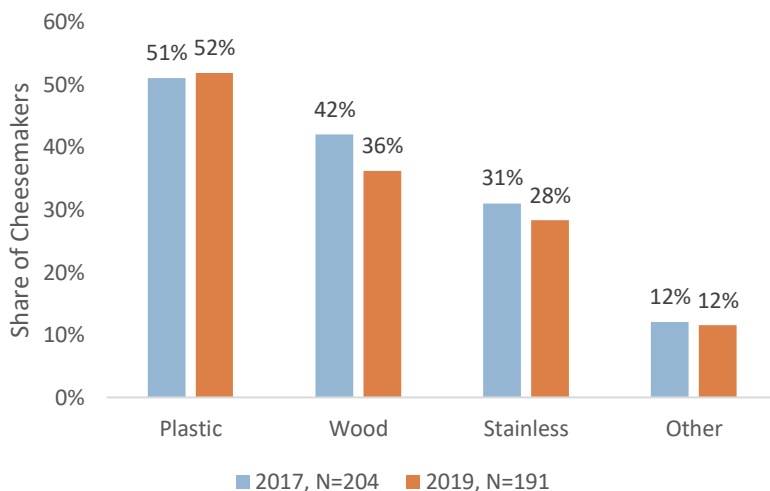


Exhibit 2.3 indicates the share of cheesemakers who reported using each surface for aging cheese in 2017 and 2019. In both 2017 and 2019, cheesemakers most commonly aged cheese on plastic surfaces (51% and 52% respectively). There was a relatively marked decrease in the number of cheesemakers reporting the use of wood surfaces to age cheese between 2017 (42%) and 2019

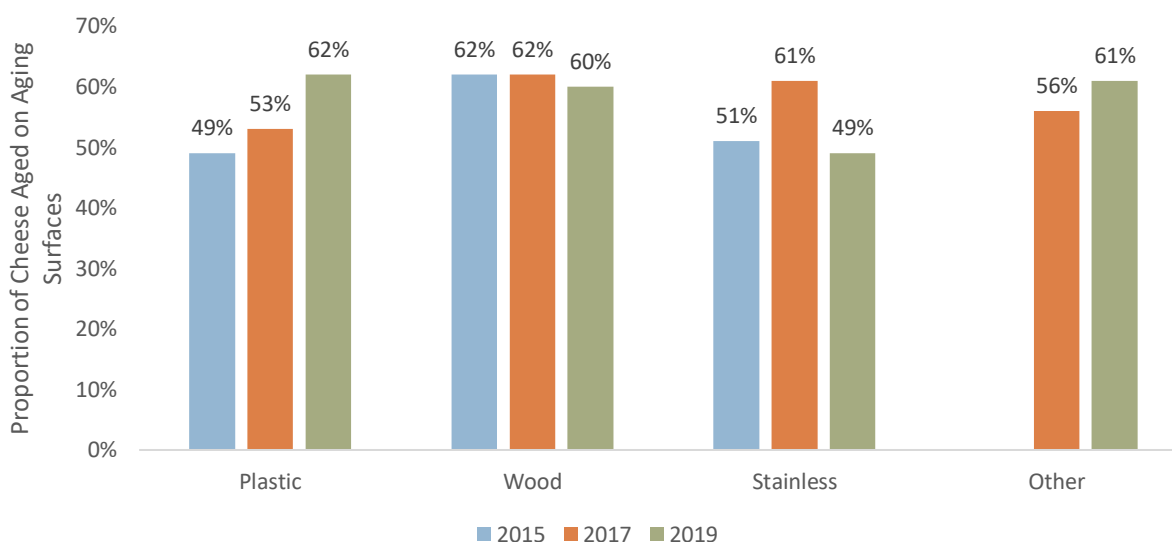
**Exhibit 3.3 — Proportion of Cheesemakers by Aging Surface**



(36%). 28% reported using stainless surfaces to age cheese in 2019 compared to 31% in 2017, and 12% reported that they used some other type of surface for aging cheese.

Cheesemakers who reported using plastic surfaces to age cheese tended to age, on average, 62% of the cheese that they produced on plastic in 2019. This is a relatively high increase over 2015 and 2017. See Exhibit 2.4. In comparison, there was a marked decrease in the proportion of cheese being aged on stainless surfaces from 2017 with an average 49% of cheese aged on this surface, similar to 2015. There was a slight decrease in the proportion of cheese aged on wood, down from 62% in 2015 and 2017, to 60% in 2019.

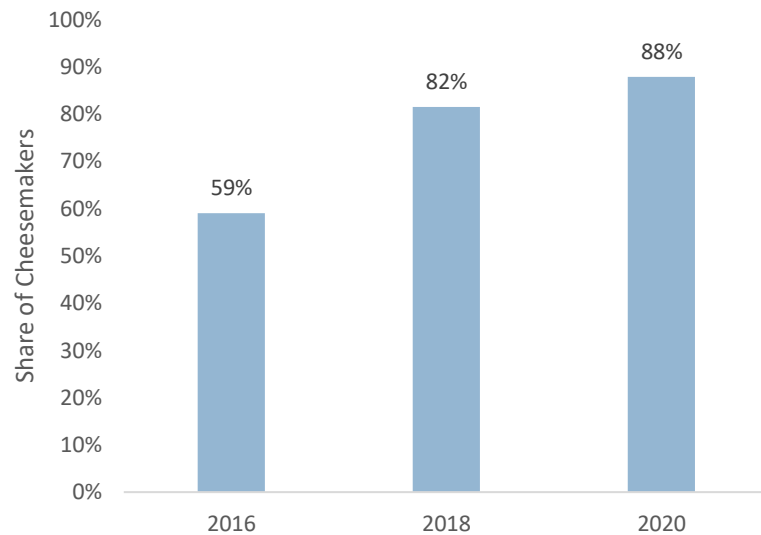
**Exhibit 2.4 — Proportion of Cheese Aged on Aging Surfaces**



# Food Safety Plan

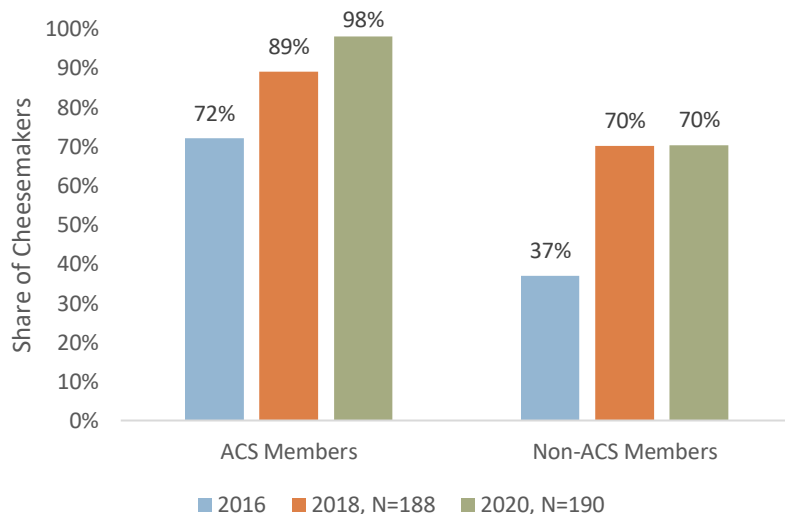
In 2020, 88% of cheesemakers reported having a current food safety plan (FSP) when they responded to the survey. See Exhibit 3.1. This is again an increase from the previous survey in which 82% of respondents reported operating with a FSP. Of the just over 12% of respondents who reported not having a FSP in 2020, 83% plan to implement one within the next 24 months. The remaining 17% (2% of all cheesemakers who responded to the survey), don't plan to implement a FSP at all. These producers ranged in size from 30 pounds of cheese produced per year to 30,000 pounds of cheese per year. It is worth noting that effective Sept. 17, 2018, all producers, including very small producers as defined by the U.S. Food and Drug Administration, are required to have a FSP in place.

Exhibit 3.1 — Businesses Operating with a Food Safety Plan



Cheesemakers who are ACS members are more likely to have a written food safety plan in place. See Exhibit 3.2. In 2020, 98% of ACS members indicated they had such a plan compared with 70% of non-members. In 2018, 89% of ACS members indicated having a written food safety plan in place compared with 70% of non-members.

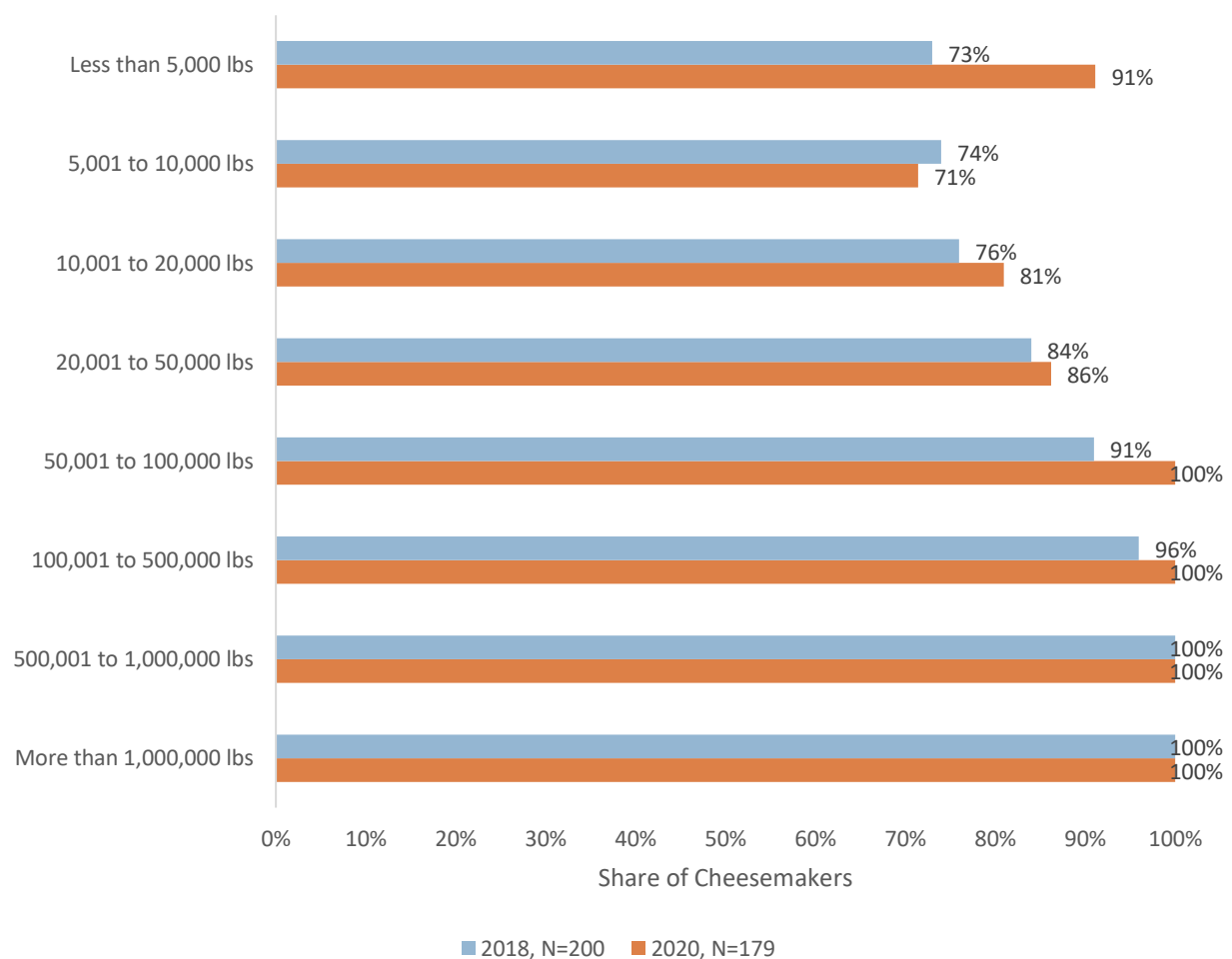
Exhibit 3.2 — Businesses Operating with a Food Safety Plan by ACS Membership



Cheesemakers who didn't have a food safety plan were more likely to be smaller businesses although 91% of businesses producing less than 5,000 pounds of cheese annually reported having a current FSP at the time they participated in the survey. Again, this is a marked improvement compared with 2018, when just over a quarter (27%) of such small businesses reported not having a FSP.

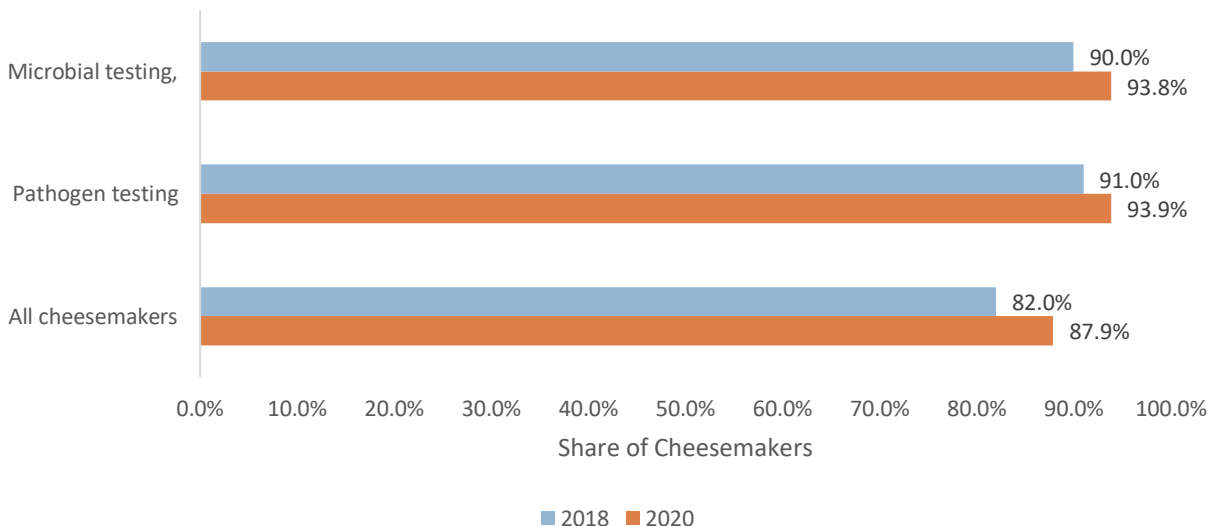
There has been a decrease in the number of cheesemakers producing between 5,001 and 50,000 pounds of cheese annually operating with a food safety plan in place from 74% in 2018 to 71% in 2020. This group are less likely to have a FSP in place compared with larger producers. All cheesemakers producing more than 50,000 pounds had a current FSP in 2020 when they responded to the survey. See Exhibit 3.3.

**Exhibit 3.3 — Businesses Operating with a Food Safety Plan by Previous Years Annual Cheese Production Volume**



Cheesemakers who reported conducting pathogen or microbial testing were also significantly more likely to have an FSP when they responded to the survey in 2020. See Exhibit 3.4.

**Exhibit 3.4 — Businesses Operating With a Food Safety Plan by Other Significant Characteristics**

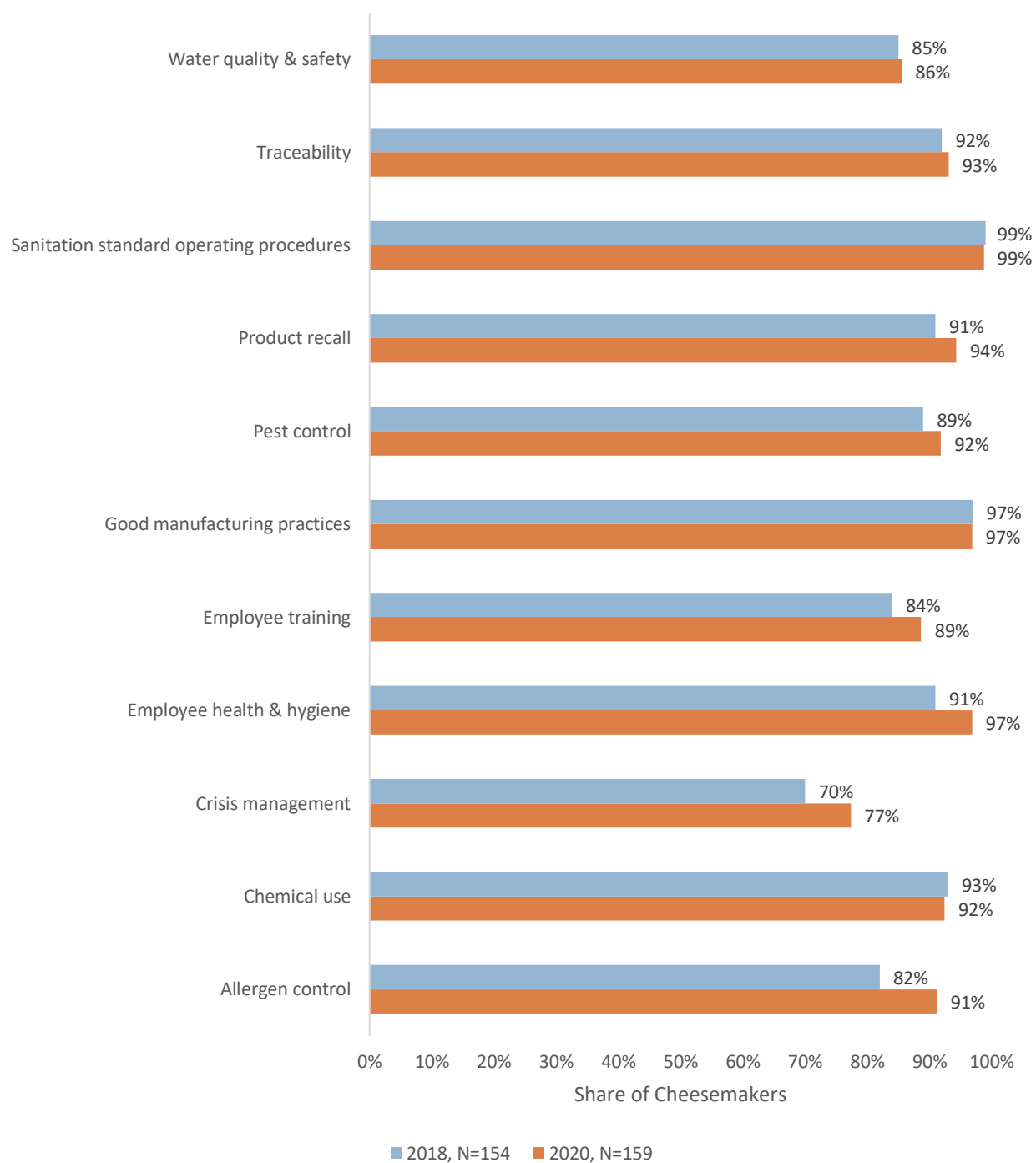


Cheesemakers were also asked about the review and documentation of their FSPs. The majority of cheesemakers – 93% - reported reviewing their food safety plans at least every 12 months. In 2018, 87% reported annually reviewing their food safety plans.

Exhibit 3.5 presents the share of cheesemakers who named having certain components in their FSPs. In 2020, the majority of FSPs included sanitation standard operating procedures, good manufacturing practices, and employee health and hygiene. Cheesemakers were least likely to include a crisis management component in their plans although there was a slight increase in the number of respondents indicating the inclusion of this section in the FSP over 2018 (70% in 2018 compared to 77% in 2020). There was also an increase in the number of cheesemakers including allergen control in their FSPs from 82% in 2018 to 91% in 2020.



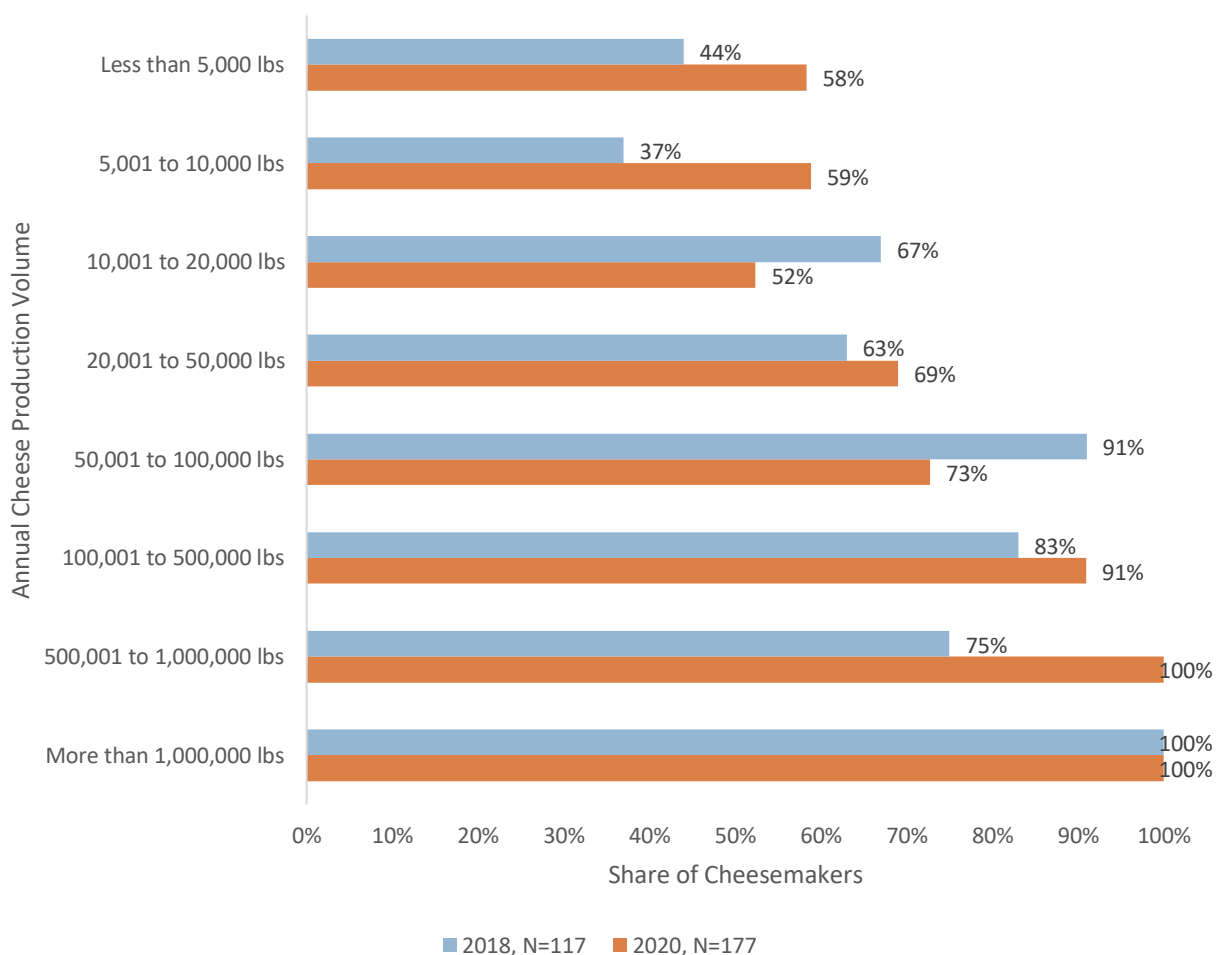
Exhibit 3.5 — Share of Cheesemakers with Specific Components Included in Their Food Safety Plans



# Milk Testing

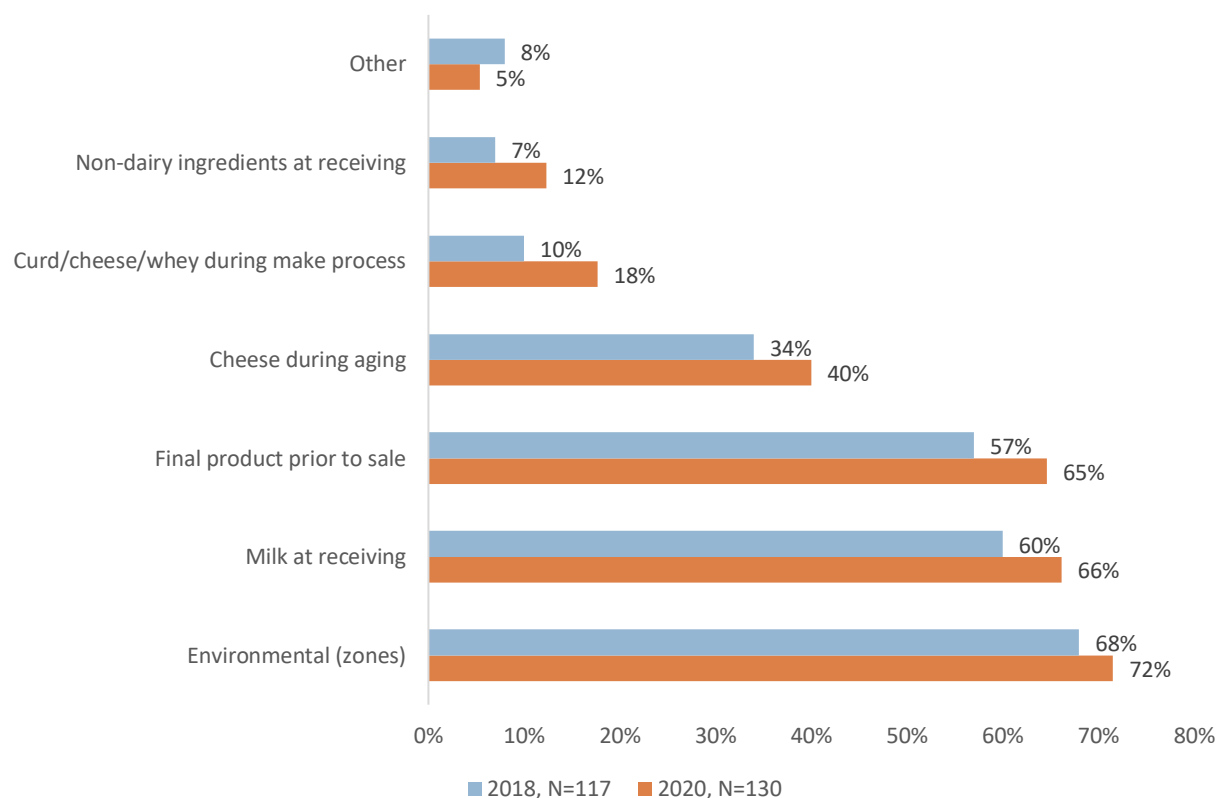
In 2020, 69% of cheesemakers reported that they conducted microbial testing. This is up from the 2018 report where 59% indicated conducting microbial testing and more in line with the 2016 figure of 71%. Among ACS members, 85% reported conducting microbial testing in 2020 compared to 73% in 2018. Of all cheesemakers who conducted microbial testing in 2020, 81% also reported conducting pathogen testing. In general, the percentage of cheesemakers conducting microbial testing increased with annual cheese production volume with all cheesemakers producing over 500,000 pounds per year conducting microbial testing. See Exhibit 4.1.

Exhibit 4.1 — Share of Cheesemakers Conducting Microbial Testing by Production Volume



As was the case in 2018, in 2020, the majority of cheesemakers conducting microbial testing reported testing environmental (zones), 72%; milk at receiving, 66%; and the final product prior to sale, 65%. There was an increase in the percentage of cheesemakers testing at all points between 2018 and 2020. See Exhibit 4.2.

Exhibit 4.2 — Points at Which Microbial Testing is Conducted



In general, cheesemakers reported a higher frequency of microbial testing than they did in 2018. See Exhibit 4.3. For example, in 2018, 4 in 10 cheesemakers were testing environmental (zones) monthly, however in 2020, less than a third of the respondents (28%) indicated they tested environmental (zones) monthly. Conversely, there was an increase in the percentage of cheesemakers performing weekly testing (from 19% in 2018 to 33% in 2020). 55% of cheesemakers reported testing every batch or lot of milk at receiving, up from 46% in 2018.

In 2018, a third of cheesemakers reported testing non-dairy ingredients at receiving annually and a third reporting testing every batch/lot. In 2020, over half of the cheesemakers testing non-dairy ingredients at receiving reported testing every batch/lot, 20% reported testing monthly, and just 7% reported testing annually.

There was a similar shift in testing cheese during aging. There was an increase in the share of cheesemakers reporting testing during aging from 34% in 2018 to 40% in 2020 (see Exhibit 4.2).

In 2020, cheesemakers were more likely to test cheese during gaining more regularly than in 2018. For example, 37% of cheesemakers tested every batch/lot during the aging process compared to 22% in 2018.

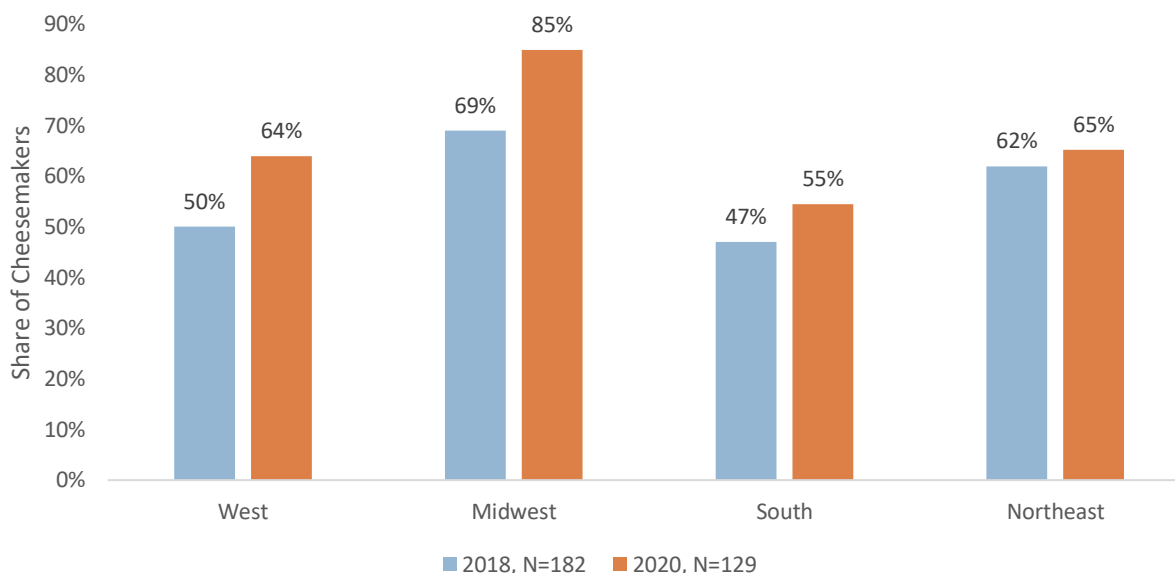
In comparison, while there was an increase in the share of cheesemakers reporting testing during the make process (from 10% in 2018 to 18% in 2020, see Exhibit 4.2), cheesemakers were less likely to test every batch/lot in 2020 than they were in 2018, with just 39% testing at this frequency compared to 70% in 2018. In 2020, respondents were more likely to report testing during the make process on a daily, weekly, twice a month, or monthly basis than they did in 2018.

Exhibit 4.3 — Frequency of Microbial Testing by Cheesemakers

	Every batch/lot		Daily		Weekly		Twice a month		Monthly		Quarterly		Annually	
	2018	2020	2018	2020	2018	2020	2018	2020	2018	2020	2018	2020	2018	2020
Milk at receiving	46%	55%	10%	12%	9%	8%	6%	6%	24%	12%	3%	6%	2%	0%
Non-dairy ingredients at receiving	33%	53%	0%	0%	0%	7%	33%	7%	0%	20%	0%	7%	33%	7%
Curd/cheese/whey during make process	70%	39%	10%	26%	0%	9%	0%	9%	0%	13%	10%	4%	10%	0%
Cheese during aging	22%	37%	0%	2%	9%	10%	9%	12%	30%	18%	22%	18%	9%	4%
Final product prior to sale	35%	40%	2%	5%	4%	9%	5%	11%	35%	16%	17%	17%	4%	2%
Environmental (zones)	2%	3%	2%	6%	19%	33%	8%	10%	40%	28%	24%	17%	6%	3%
Other	13%	33%	0%	0%	13%	0%	13%	0%	50%	33%	13%	33%	0%	0%

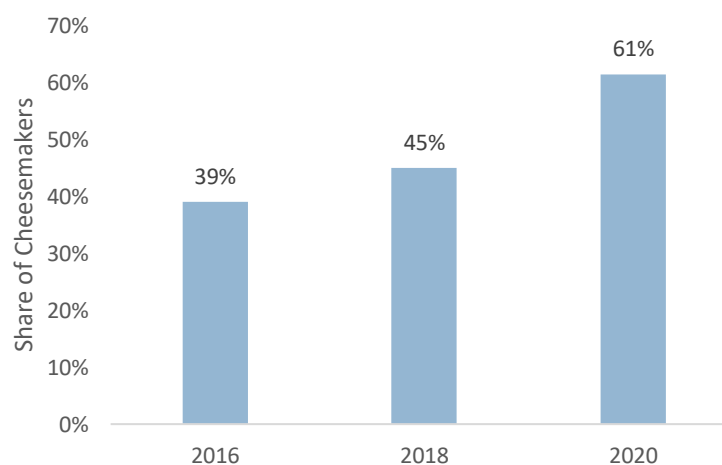
Compared to 2018, there was an increase in the number of cheesemakers reporting conducting microbial testing in every region. See Exhibit 4.4. The Midwest again had the highest percentage of cheesemakers who conducted microbial testing in 2020, and the South had the lowest percentage conducting microbial testing. In 2020, 85% of Midwest cheesemakers conducted microbial testing compared with 55% of the cheesemakers in the South region.

Exhibit 4.4 — Share of Cheesemakers Conducting Microbial Testing by Region



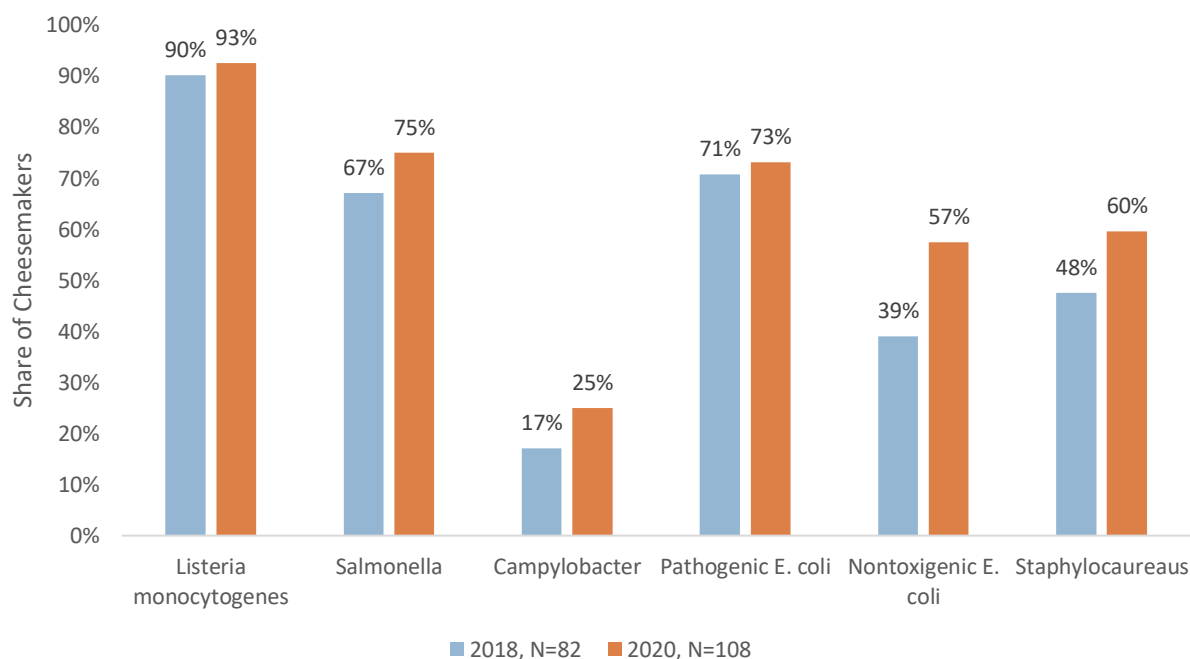
In 2020, 61% of cheesemakers reported that they conducted pathogen testing, up from 45% in 2018 and 39% in 2016. See Exhibit 4.5. A higher proportion of ACS members reported conducting microbial testing, 72%, compared with non-members, 42%. This was an increase from the 2018 figures in which 58% of ACS members reported conducting microbial testing, compared to 27% of non-members.

Exhibit 4.5 — Share of Cheesemakers Conducting Pathogen Testing



Compared to 2018, there was an increase in the share of cheesemakers conducting testing of all common bacterial targets for pathogen testing. See Exhibit 4.6. The biggest increase was in the numbers of cheesemakers reporting testing for *nontoxigenic E. coli*, up from 39% in 2018 to 57% in 2020.

Exhibit 4.6 — Share of Cheesemakers Conducting Specific Pathogen Tests



While there was a slight increase in the share of cheesemakers testing for *Listeria monocytogenes* between 2018 and 2020 (90% and 93% respectively), the only testing point reported more often for this test in 2020 than in 2018 was non-dairy ingredients at receiving (from 40% in 2018 to 50% in 2020, see Exhibit 4.7). In comparison, an increase in the number of cheesemakers reporting testing for *Nontoxigenic E. coli* was matched by an increase in the number of cheesemakers testing at each testing point.

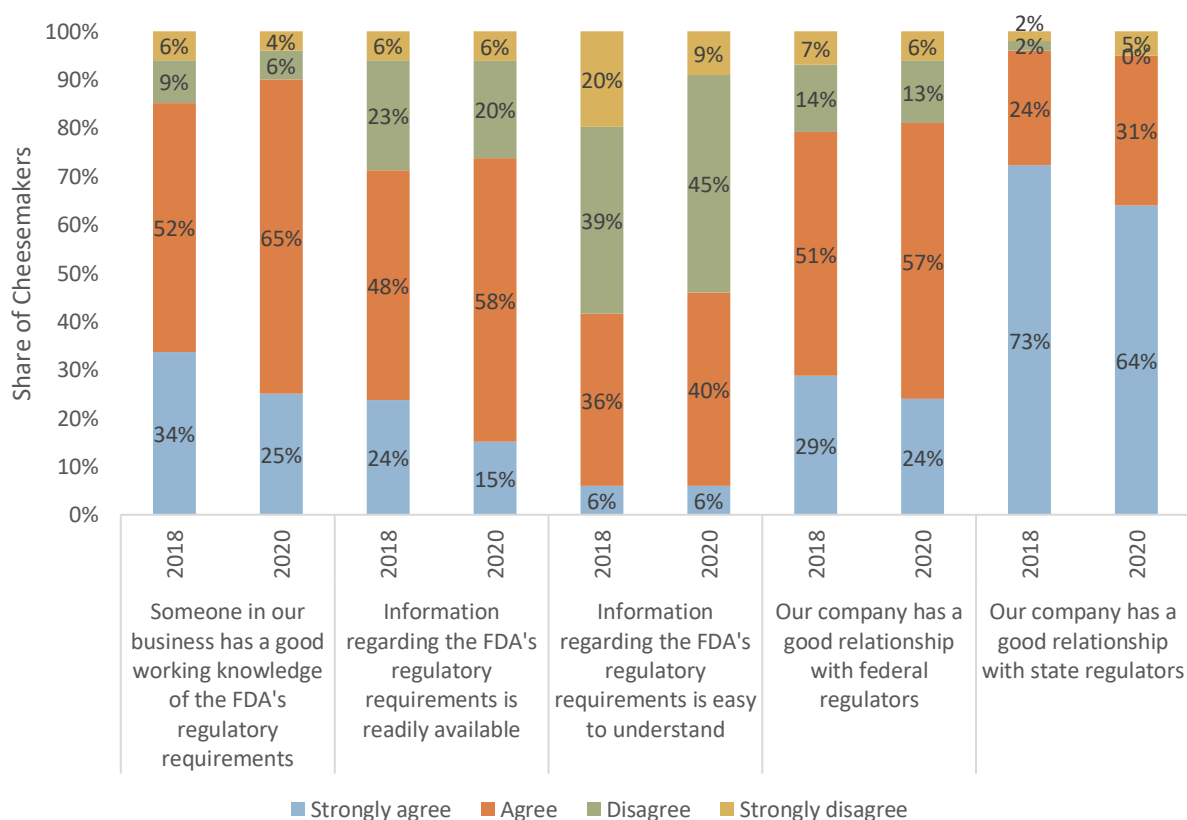
Exhibit 4.7 — Share of Cheesemakers Conducting Pathogen Testing at Specific Points

	Listeria monocytogenes		Salmonella		Campylobacter		Pathogenic E. coli		Nontoxigenic E. coli		Staphylocaureus	
	2018	2020	2018	2020	2018	2020	2018	2020	2018	2020	2018	2020
Milk at receiving	66%	60%	47%	35%	13%	23%	56%	58%	47%	60%	53%	48%
Non-dairy ingredients at receiving	40%	50%	60%	75%	20%	13%	60%	63%	40%	63%	20%	25%
Curd/cheese/whey during make process	86%	44%	86%	56%	14%	22%	86%	56%	57%	78%	57%	67%
Cheese during aging	94%	74%	71%	55%	13%	13%	61%	48%	48%	55%	45%	52%
Final product prior to sale	93%	83%	65%	62%	9%	16%	62%	63%	35%	50%	45%	49%
Environmental (zones)	98%	90%	43%	48%	10%	10%	33%	44%	23%	35%	20%	23%
Other	50%	33%	50%	33%	50%	0%	100%	66%	50%	66%	0%	66%

# Regulatory Knowledge & Information

In 2020, the majority of cheesemakers agreed or strongly agreed that they had a good relationship with state regulators although the share of cheesemakers strongly agreeing with this statement was less than in 2018 (64% in 2020 and 73% in 2018). See the blue bars in Exhibit 5.1. There was an increase in the share of cheesemakers disagreeing with the statement that “Information regarding the FDA’s regulatory requirements is easy to understand” (see the green bars representing 39% in 2018 and 45% in 2020), however more cheesemakers strongly agreed or agreed with this statement than in 2018 (orange and blue bars totaling 42% in 2018 and 46% in 2020). Cheesemakers in the South and Northeast were more likely to report a good relationship with state regulators than those in the West and Midwest, with 18% of cheesemakers in both the West and Midwest strongly disagreeing with the statement “Our company has a good relationship with state regulators.”

Exhibit 5.1 — Share of Cheesemakers Agreeing with Statements Regarding Regulatory Knowledge and Information, 2018 (N=197) and 2020 (N=127)

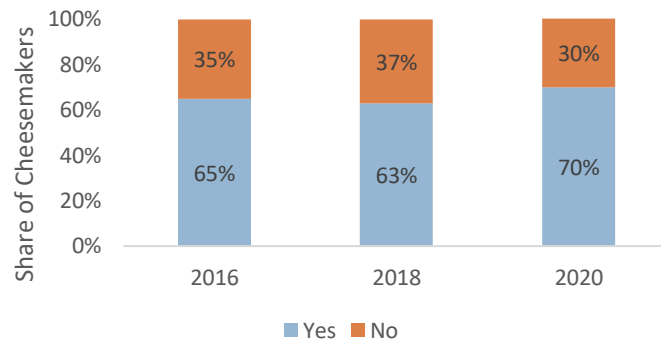




# Inspections & Audits

In 2020, 70% of cheesemakers reported that they had previously had an FDA audit or inspection, up from the previous survey results in 2016 and 2018. See Exhibit 6.1. In the 2020 survey, 57% of cheesemakers said they had been inspected in the past two years, a slight increase over the 2018 figure of 54% and in line with the 2016 figure of 57%.

Exhibit 6.1 — Share of Cheesemakers Audited or Inspected

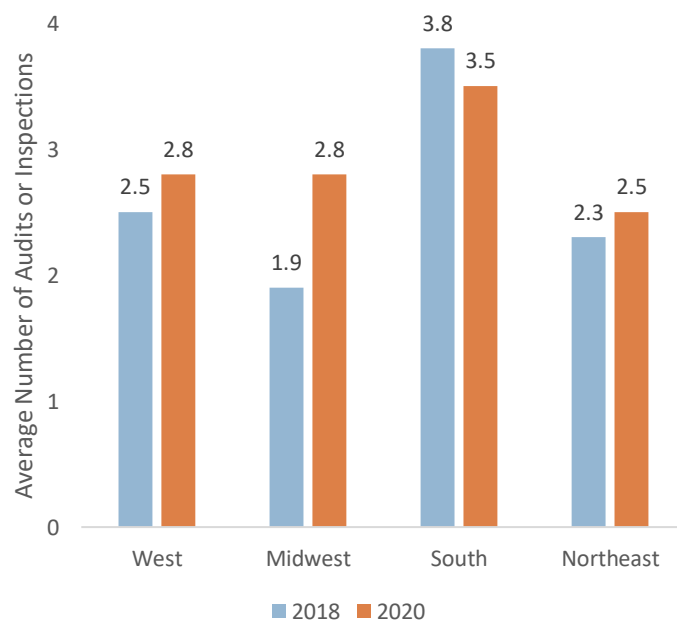


The average number of inspections reported by cheesemakers in the 2020 survey was 2.9 compared with 2.6 in the 2018 survey and 2.7 in the 2016 survey; these are averages of the number of inspections conducted during the five years preceding the survey. In 2020, 56% of cheesemakers reported having had two or fewer inspections in the past five years, down from the 2018 figure of 61%.

In 2020, cheesemakers in the South again reported more audits or inspections in the past five years than those in the other three regions although this number was slightly down from 2018 (3.8 in 2018 to 3.5 in 2020). See Exhibit 6.2.

Cheesemakers in the Northeast reported the fewest audits or inspections in 2020 at 2.5 with cheesemakers in the West and Midwest region both reporting an average 2.8 audits or inspections in the past five years. In 2020, cheesemakers in the Midwest region reported a relatively higher increase from 2018 in the number of audits or inspections in the past five years compared to the other regions.

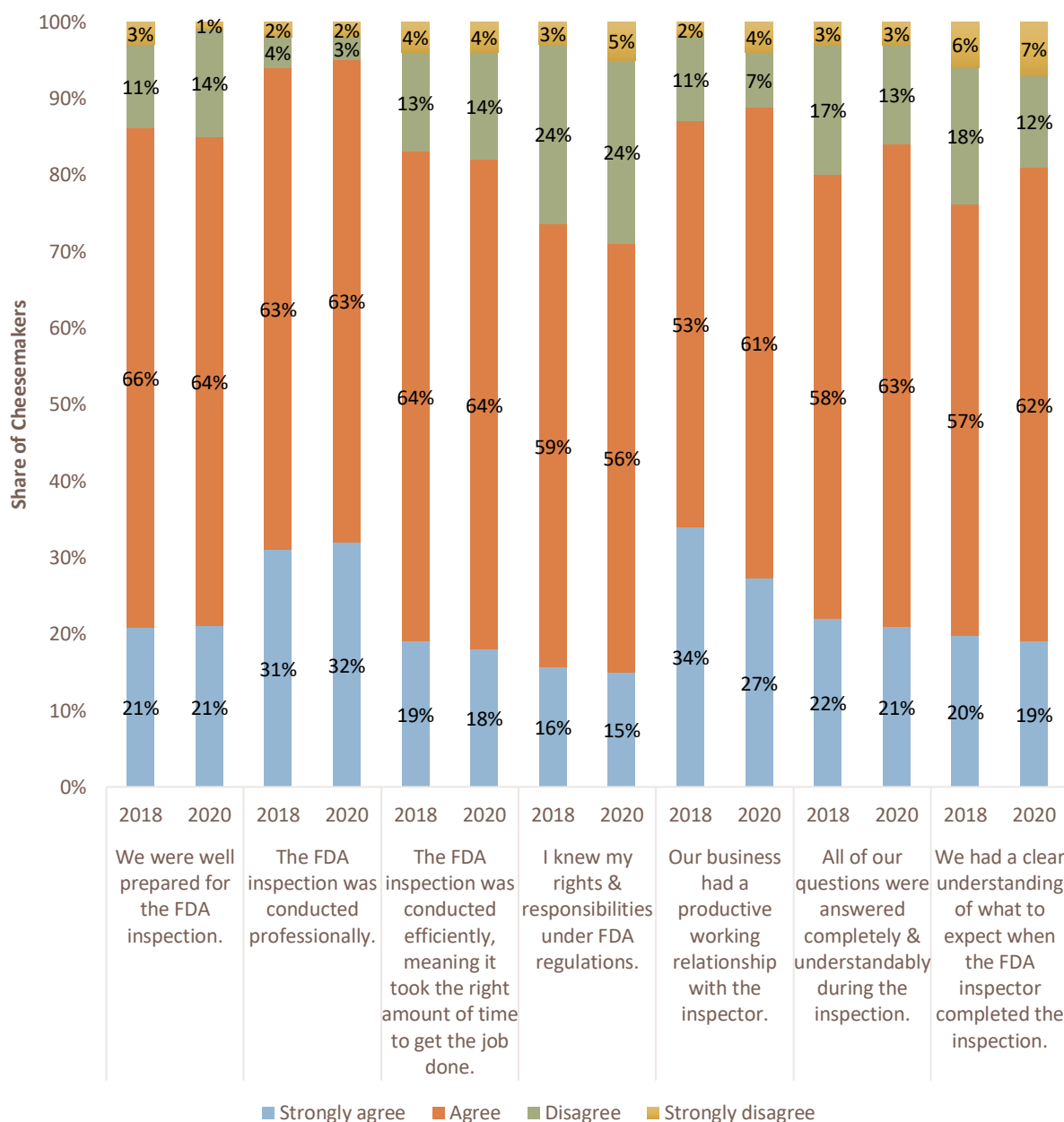
Exhibit 6.2 — Average Number of Audits or Inspections in the Past Five Years Reported by Cheesemakers by Region



Inspections reported in the 2020 survey were fairly evenly split between those conducted by the state on behalf of the FDA (41%), and those conducted by FDA inspectors (44%). These data are consistent with the 2018 and 2016 surveys.

In general, cheesemakers reported favorable opinions of FDA inspection experiences in 2020 as they did in 2018. Exhibit 6.3 shares cheesemaker responses to a variety of statements about their FDA inspections. Similar to 2018, cheesemakers showed the most disagreement with knowing their rights and responsibilities.

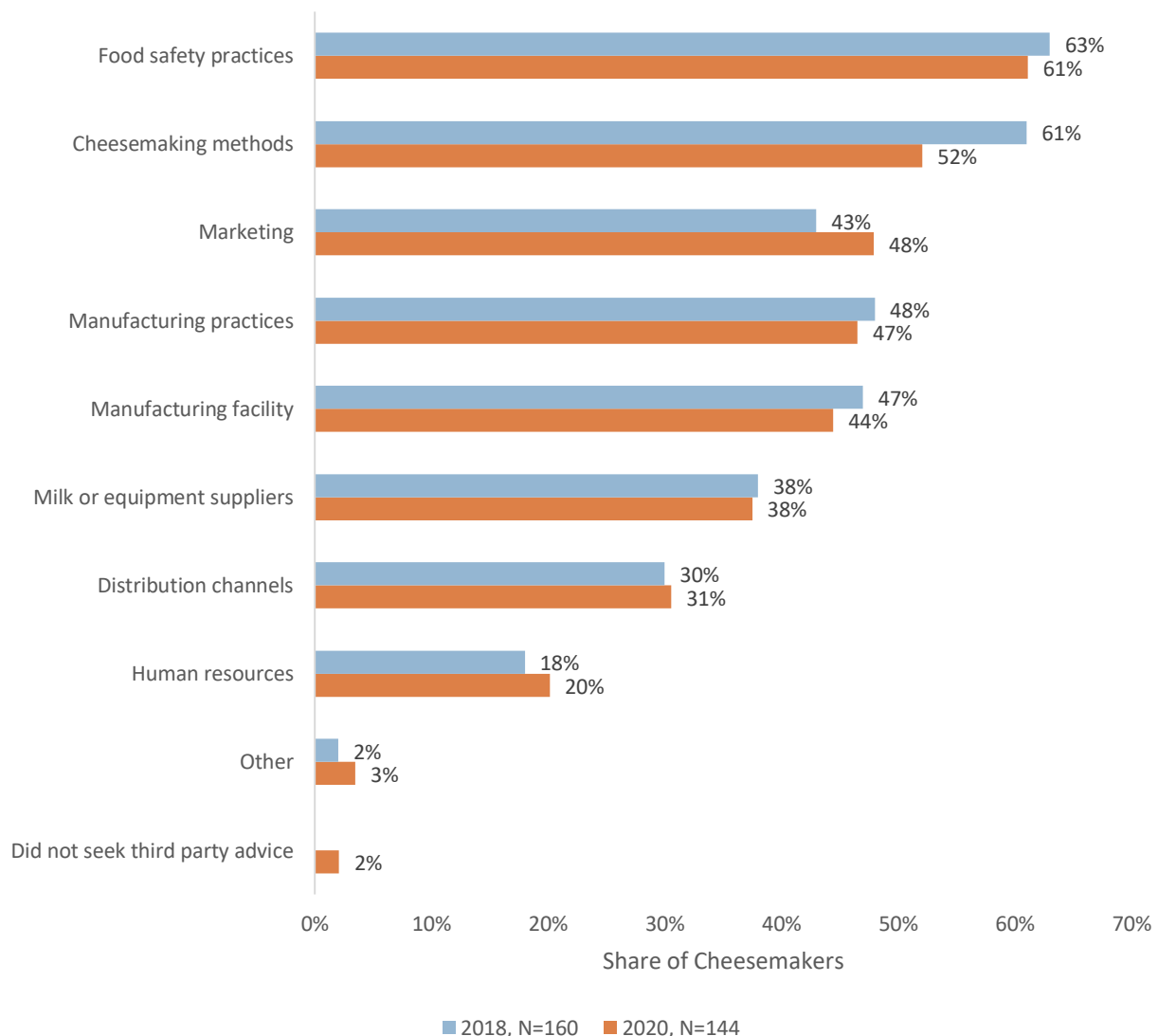
**Exhibit 6.3 — Share of Cheesemakers Agreeing with Statements Regarding Audits/Inspections, 2018 (N=122) and 2020 (N=95)**



# Sourcing of Advice

Exhibit 7.1 indicates the areas in which cheesemakers sourced third-party advice for in 2018 and 2020. In both surveys, cheesemakers most commonly reported seeking third-party advice regarding food safety practices, (61% in 2020), and cheesemaking methods, (52% in 2020), although there was a notable decrease in the share of cheesemakers reporting that they sought advice regarding cheesemaking methods between 2018 and 2020 (61% and 52% respectively). In comparison a higher share of cheesemakers reported seeking third-party advice regarding marketing and human resources in 2020 than in 2018.

Exhibit 7.1 — Share of Cheesemakers Seeking Third-Party Advice In the Previous Three Years



A statistically significant relationship was identified between average profit margin and seeking third party advice in both 2018 and 2020. In 2018, cheesemakers who sought advice regarding food safety practices tended to have a profit margin that was 7 percentage points lower than cheesemakers who didn't seek this advice. In 2020, this difference increased to an average profit margin 14 percentage points lower for cheesemakers who sought advice regarding food safety than those who didn't seek this advice, meaning the likelihood of seeking advice regarding food safety increases as profit margin decreases.

Of the cheesemakers who sought advice from a third party in the three years prior to 2020, another cheesemaker was most likely to be consulted regarding cheesemaking methods, distribution channels, and milk or equipment suppliers. This was similar to results of the 2018 survey. See the orange bars in Exhibit 7.2. While there was only a small increase in the share of cheesemakers reporting that they sought third-party advice regarding human resources between 2018 and 2020 (18% and 20% respectively, see Exhibit 7.1), there was a notable increase in 2020 in the share of cheesemakers reporting that they sought advice regarding this topic from another cheesemaker (from 16% in 2018 to 39% in 2020). In comparison there was a decrease in the share of cheesemakers who reported seeking advice regarding manufacturing practices from another cheesemaker in 2020 (28%) compared to 2018 (37%).

**Exhibit 7.2 — Share of Cheesemakers Seeking Third-Party Advice from Another Cheesemaker In the Previous Three Years**

