MARKETING THE TASTE OF PLACE: THE CASE OF VERMONT MAPLE SYRUP
FY 2009

Vermont is the largest U.S. producer of maple syrup and second largest in the world after Quebec. Over 30% of total U.S. maple syrup production is from Vermont, and 2,000+ people are employed in maple production during the sugaring season. The needs of maple producers and consumers have changed in recent years. Currently, much research focuses on developing systems to produce more "fancy"-grade syrup which has historically commanded the highest price. However, profits from the sale of maple syrup on a per-gallon basis have become more volatile as vast quantities of syrup produced and blended in Quebec have flooded the market. Vermont producers cannot compete on volume, and so are seeking ways to differentiate their syrup. At the same time, consumers are no longer as interested in the lightly-flavored "fancy"-grade syrup, but they increasingly prefer darker, more "maple"-flavored syrup. With the growing interest in local food, more people are becoming interested in producing *and* consuming maple syrup and establishing and appreciating a "place-based" identity.

The University of Vermont, in cooperation with the Vermont Agency of Agriculture, developed two "flavor wheels." One describes the naturally occurring flavors in Vermont maple syrup to help producers and consumers better understand the subtle differences in maple syrup. The other, an "off-flavor wheel," helps producers identify the sources of production off-notes in their syrups. Vermont sugarmakers learned how to use the flavor wheels to improve and enhance their marketing strategies. This ground-breaking project has attracted much attention from other maple-producing states and Canada, and it has implications for other specialty agricultural products that use place-based marketing.

FINAL REPORT
The Map of Maple
The Map of Maple – Off-Flavors

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FSMIP Final Report
Marketing the Taste of Place: The Case of Vermont Maple Syrup

Introduction and Background

Making and selling maple syrup has long been a critical component of Vermont's agricultural and cultural heritage. Vermont is the largest producer of maple syrup in the United States and the second largest producer in the world, following Quebec. Over 30% of total US production of maple syrup is from Vermont, and more than 2,000 people are employed in maple production during the sugaring season. Maple sugar and syrup has been produced in the region since well before the creation of the United States, and has become an important part of Vermont's state identity.

The needs of maple producers and consumers, however, have changed in recent years. Presently, much research focuses on developing systems to produce more syrup, especially "fancy"-grade syrup, which has historically commanded the highest price. For example, there has been USDA funded research at Proctor Maple Center to use technology to lighten all grades of syrup and thus create more "fancy" grade syrup. For several reasons, research of this type is no longer the most appropriate vehicle for helping maple producers. First, profits from the sale of maple syrup on a per-gallon basis have become more volatile as vast quantities of syrup produced and blended in Quebec has flooded the market; producers cannot compete on volume, and so are looking for ways to differentiate their Vermont-made syrup. Second, consumers are no longer as interested in the lightly-flavored "fancy"-grade syrup; increasingly consumers prefer darker, more "maple"-flavored syrup, and research is needed to optimize the production of this sort of product. Finally, more people are becoming interested in producing *and* consuming maple syrup; as small-scale, localized agriculture becomes increasingly popular, new producers are making maple syrup, and new consumers are interested in its "place-based" identity.

In order to benefit producers who are looking to optimize the maple-based flavors of their syrups, the University of Vermont Agricultural Experiment Station in cooperation with the Vermont Agency of Agriculture undertook a research project to develop a "flavor wheel" to describe the naturally occurring flavors in Vermont maple syrup and an "off-flavor wheel" designed to help producers identify the sources of production off-notes in their syrups. In addition, the project sought to establish preliminary links between Vermont's working landscape and the flavor characteristics of Vermont maple syrup as part of Vermont's ongoing "Taste of Place" working group.

Previous research in Quebec established a flavor wheel for maple products consisting of 13 "flavor families" with 91 sub-flavors, but this work was based entirely on Quebecois maple products. There is a substantial body of research that indicates other quality aspects of food products – including but not limited to mouthfeel, texture, and appearance – significantly impact flavor perception, and many of these qualities differentiate Vermont maple syrup from Quebecois maple syrup. For example, Vermont maple syrup is rarely blended – it is usually bottled from single producers – and has higher density standards which should affect both flavor perception and mouthfeel. Preliminary research with unblended Vermont maple syrup samples conducted by a group of researchers from Middlebury College and the University of Vermont identified significant differences between Quebecois and Vermont maple products, indicating the need for further research into the unique flavor qualities of Vermont maple syrup.

The main research team for this project comprised Dr. Amy Trubek and Dr. Montserrat Almena-Aliste in the Department of Nutrition and Food Science (NFS) at the University of Vermont Agricultural Experiment Station, and Henry Marckres, Maple Specialist at the Vermont Agency of Agriculture, Food, and Markets (VAAFM). A sensory panel consisting of Vermont sugarmakers, Vermont food professionals, wine experts, and faculty members of the University of Vermont's NFS department worked to describe the sensory profile of a broad range of Vermont maple syrups.

Henry Marckres is the acknowledged expert in maple syrup production and grading at VAAFM. In this project, he trained the sensory panel on the existing standards for maple syrup grading, and, more critically, provided his twenty-plus years of expertise in off-flavor detection and prevention. He also used his regularly held training events for producers to disseminate and test the materials produced by this project. Dr. Almena-Aliste, an expert in sensory and consumer research, trained and directed the panel in appropriate methodology for objectively determining the flavor components and overall sensory properties of Vermont maple syrup. Dr. Trubek oversaw the research and helped integrate the flavor research into the broader historical and cultural context of maple production in Vermont.

Maple syrup is a natural product with highly variable sensory characteristics due to multiple factors, including origin, seasonal changes in sap chemistry, production, and packaging techniques among others. The diversity and differentiation on sensory properties make maple syrup especially interesting as a case study for sensory science, along with its innate tastiness and uniqueness of the product. Vermont is the second largest maple producer in North America and Vermont maple syrup is not only one of the most precious agricultural products of the state, but also it is part of the state's cultural heritage.

Currently, color grading is the only method of classification to categorize maple syrup, although it is expected than within the next few years flavor descriptors will also be applied (this decision has been approved by the International Maple Federation). However, up until now there has been no well-tested and well-conceived tool available to help describe and characterize maple syrup in general, and ultimately educate the public about how to taste and enjoy this unique and traditional agricultural product. Increasingly, such tools are available for food produces as diverse as chocolate, coffee, cheese and wine. Furthermore, most of the studies in sensory quality of maple syrup have focused on defects, but lack the descriptors to describe, define and differentiate the overall sensory quality and uniqueness of maple syrup.

Project Objectives and Plan

The goal of this project was to do research and outreach that supports small-scale maple syrup makers and the marketing of Vermont maple syrup in general – research that generates *new* tools and *new* ways to explain the uniqueness of the product, Vermont, and the linkage between taste and place to consumers. The tool chosen for this purpose was a modified "sensory wheel". Sensory wheels are simple but extremely useful tools for describing the range of flavors, textures, and other organoleptic properties of foods. In particular, sensory wheels are useful for foods with complex sensory properties. For example, sensory wheels have proved extremely useful for the sensory description of wines and cheeses. The two sensory maps created by this project are cutting-edge and timely marketing and production tools for the maple industry, but also help educate consumers and create links that support local agriculture and rural ways of life. Specifically, the goals were as follows:

Objective 1: To create two descriptive sensory wheels for sugarmakers; one that explains unique and positive sensory characterisitcs and one that troubleshoots for negative characteristics.

In order to accomplish this goal, the three primary researchers worked with a sensory panel to develop these wheels according to established principles of sensory science research methodology. Dr. Trubek and Dr. Almena-Aliste were the primary coordinators for this part of the project.

55 maple syrups samples, from 18 Vermont sugarmakers located in different parts of the state, were collected within Spring 2010. Sample collection included different grades of the product, consisting of 14 samples of "Fancy"; 15 samples of "Grade A Medium Amber", 14 samples of "Grade A Dark Amber" and 12 samples of "Grade B." In addition to diversity in location, the selected producers were chosen for having some diversity among them in terms of

sensory profiles. These 55 samples were specifically used for the last step of the project in order to generate the final vocabulary selection to describe the product. Additional samples were collected in previous years during the preliminary steps of the study to create the foundation of the work, including the generation of the preliminary sensory descriptors.

A sensory panel of 14 panelists (2 Maple Producers, 1 Maple specialist, 3 Wine experts, 1 Beer specialist, 3 Faculty members of the Department of Nutrition and Food Sciences at the University of Vermont, and other 4 Food Professionals) participated in the study. As part of the study, the panelists completed a training course in maple syrup evaluation, including 2 sessions on aromas and flavors identification and 1 session (3 hours each) on maple syrup grading and off-flavors identification.

The 55 samples were evaluated within 3 tasting sessions (5 hours each). The samples were poured (aprox. 3 mL) into transparent soufflé cups coded with three-digit random numbers and served at room temperature. Water and unsalted crackers were provided to cleanse the palate between samples. During evaluation, panelists performed quantitative and qualitative measurements of organoleptic properties (appearance, aroma, flavor, taste and texture) using descriptive techniques. Additionally, after evaluation, the panel use one session (aprox. 5 hours) for vocabulary selection of the sensory terms. As indicated previously, basic vocabulary generation was developed on preliminary steps of the study. All sensory training and discussion was carried out at the University of Vermont.

Objective 2: To provide educational opportunities for sugarmakers to learn how to use the Maps of Maple (both descriptive and off-flavor) for market promotion.

After the sensory research work was carried out, Maps of Maple (see Appendix 1 and 2) were conceived to convey the results of the research to maple producers and to the general public. A graphic designer was commissioned to design the Maps of Maple to be attractive, eye-catching, and user-friendly. The research team worked closely with the graphic designer to develop a sensory tool that reflected the results of the sensory panel but also conveyed abstract sensory concepts in a clear manner. 2,000 Map of Maple and 2,000 Off Flavors Maps were printed in full color and on durable plastic. Henry Marckres of VAAFM was given primary responsibility for their distribution. They were made available free of charge to both producers and the general public.

In addition, Henry Marckres has worked to employ the Maps of Maple in the training sessions he regularly conducts for sugarmakers both in Vermont and around the country. There has been tremendous positive feedback on the sensory tools, not just from within Vermont, but also the United States and Canada. The maps will continue to be made available to the public at various Vermont food-based events, such as the Vermont Fresh Network annual meeting (a local non-profit that supports consumer education on local and place-based foods).

Here are some examples of the early response to the sensory tools.

- In January 2012 Henry Marckres made a presentation to a delegation from China on maple syrup. The group was from the Northeast Agricultural University of China, and hosted by Dr. Mingruo Guo of UVM. We're happy to say that the Map of Maple is now headed for China!
- By February 2012, Henry Marckres had presented the Map of Maple to roughly 500 sugarmakers and most recently, the Board of Directors of the International Maple Syrup Institute (IMSI). Most producers are interested in both Maps and want to use them as soon as they can.
- At the IMSI meeting in January 2012, Henry Marckres gave copies to the attendees, including Center Acer (the maple syrup research institute in Quebec). After his talk, he was approached by several Canadians, one of whom wanted 100 copies! Copies are now in most maple producing states and provinces!

Objective Three: To develop an interactive wheel to be used in web-based marketing that explores the taste of Vermont maple syrup through images, stories and sensory terminology.

This objective proved more challenging than initially anticipated. The idea for the interactive wheel was developed by the research team without consulting a graphic designer. We collected a series of images that could be create a visual and written mosaic of maple syrup in Vermont, paste and present. However, after several consultations with the graphic designer, she ultimately declared it would be prohibitive (in terms of labor and time) to actually make an interactive instrument. Since our first priority was to develop, print and distribute the map of maple and the off-flavors map, we decided to put this part of the project on hold. We used the extra funds (approximately $2,000 to print more maps of maple for distribution by Henry Mackres and the VAAFM.

Results, Conclusions, and Lessons Learned

This project has been highly productive. The research has generated improved understanding of the unique flavors of Vermont maple syrup and a tool for conveying these properties for the producers. Response from VAAFM and producers has been overwhelmingly positive. Appendix 1 and 2 include the two types of maps of maple syrup developed. Appendix 1 includes the map of maple (for regular product), and Appendix 2 the map for defective product (off-flavors).

Table 1 list the initial descriptors generated during the preliminary steps of the study, including the 5 major categories initially consider to include in the sensory map of the product: Appearance – Flavor – Taste- Aftertaste and Mouthfeel. The table also shows the terms (descriptors and/or categories) that during the last part of the study were Deleted (D), Modified (M), or Retained either on the off-flavors map (R-OF) or the regular map (R-M).

Table 2 summarizes the final collection of descriptors included on the map of maple, the 3 major final categories retained (Aroma and Flavor – Taste and Mouthfeel) and the different families of aromatics used to organized the different descriptors. Table 2 also relates the final descriptors with the original lexicon, indicating which were the Original terms identified on preliminary steps of the work (O), Added (A) or Modified (M). Modification or changes in this context, relate to both, specific changes on the terms (example : from the original term “apple” selected on the preliminary stages to the final term selected “baked apple”; or from “marshmallow” to “roasted marshmallow”), as well as the specific family or category where the specific term has being finally associated (example: the term vanilla was initially consider within the ‘toasted family” but at the end was consider within the category of “spice”; or in the case of apple, the change included “baked apple” and “toasted family” instead of “apple” and “fruity family”).

During the quantitative part of the research the panel leader (Dr Almena-Aliste), with the assistance of the panelists, came up with a list of 51 final descriptors, consisting of 43 terms to describe aroma and flavor, 3 describing taste and 5 describing mouthfeel (Table 2). In addition to listing the nature of the specific final descriptors, the final map defined for regular product (Appendix 1) also included the concept of intensity. In this context, intensity is associated either to the intensity of the presence of the specific notes of some family of aromas and flavors (ie; brioche - roasted marshmallow representing increase in intensity for the corresponding notes of the “toasted” family but also associated with the presence of delicate vanilla notes; or raisin – prunes for the “fruity” family and also associated with dried fruits), as well as some gradient on the intensity of specific category (ie: smooth-mineral in terms of mouthfeel properties. For additional details on this aspect please check the final map of maple (Appendix 1).

For of the construction of the map of off flavors (Appendix 2). Dr Almena-Aliste from the University of Vermont, with the assistance of Henry Mackres, the Maple specialist from the Vermont Agency of Agriculture, Foods and Markets (VAAFM), depicted the sensory properties of the defective product and associated it with the cause. The content of the map of off-flavors it is based on the VAAFM "Maple Syrup Off-Flavors" manual, but it is a more comprehensive approach and a user-friendly representation.

The project team worked with University of Vermont's Center For Rural Studies (a fee for service survey and evaluation center) to do a two part evaluation of the sensory tools. First, after we developed an initial draft of each tool, we attended three separate conferences for sugarmakers in Vermont. CRS developed a feedback survey which we administered to over 50 people. The results of these surveys were used to refine and revise the final tool. Once the sensory tools were finalized and printed, we collaborated with CRS to develop an evaluation on the final products. Henry Marckres distributed the tools and the surveys in October and December of 2011 at two maple grading schools (one was national and one was regional). The final results of these surveys are attached (see Appendix 3). The survey results are very positive for both sensory tools. For the Map of Maple, 50% of the respondents agreed and strongly agreed that the map of maple would be useful for marketing their syrup and 25% were neutral (there appeared to be a group that liked the tool but mostly blended their syrup, and thus were not sure about the final usefulness of the tool) . At the same time, 90% of the respondents said that the description of how to taste maple syrup (which is on one side of both tools) was useful, and 80% of the respondents agreed that they were able to understand how to use the Map of Maple. The results of the survey for the Off-Flavors Map were even more positive, with 69% of the respondents stating that the tool would help improve the quality of their maple syrup.

Project Beneficiaries

This project particularly benefits maple syrup producers in Vermont, but it also provides a model for similar research in other maple-syrup producing areas of the United States, such as Maine, New Hampshire, and Michigan. The Map of Maple tools produced by this project, while calibrated particularly for Vermont maple syrup, are potentially starting points for those regions. The Off-Flavor Map, in particular, is a valuable aid for quick response and rectification of production problems in maple syrup. As mentioned above, we have all been pleased by the interest in the Map of Maple and the Off-Flavors Map by people involved in the maple syrup sector in a number of regions in Canada. We envisioned the tool as being primarily of regional interest, but it appears that the need for such a guide is greater!

In Vermont, the Map of Maple is the first step in a project that attempts to valorize maple syrup producers not only for the quantity of syrup they can produce, but for the unique quality of their syrups. This project is the proverbial tide that lifts all boats: that is, all maple syrup producers in Vermont will benefit as their syrup is no longer considered an exchangeable commodity, like sugar or flour, but as a product worthy of connoisseurship like chocolate, coffee, or wine. Vermont maple syrup is inextricably tied to the working landscape of Vermont, its pastoral countryside and traditions, and empowering sugarmakers to increase their profitability will lead to increased sustainability of rural communities and opportunities for rural development.

In addition, the Maps of Maple are useful tools for increasing consumer engagement with maple syrup. Producers are able to use them to better describe and differentiate their syrups, and consumers can use the Maps to increase their knowledge of and ability to understand maple syrup. Initial response from consumers has been highly positive.

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FSMIP Final Report
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the map of maple

intensity →

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aroma and flavor

maple	maple	
toasted	baked apple brioche golden sugar crème brûlée	toasted nuts roasted marshmallow burnt sugar caramel coffee
milky	fresh butter condensed milk	melted butter butterscotch
confectionary	light brown sugar molasses	dark brown sugar toffee
spice	vanilla nutmeg	cinnamon mixed spices
fruity	raisins orange peach mango raw nuts	prunes grapefruit apricot
floral	honey floral blend	
earthy	grassy oats mushroom	hay
others	praline bourbon spiced meat mineral notes	dark chocolate soy sauce leather

taste

sweetness	← balance →	maple intensity

mouthfeel

smooth ← → mineral		
thin	syrupy	thick

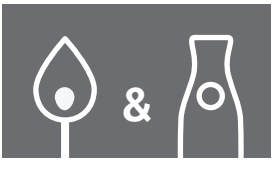
tasting maple syrup

The **map of maple** is a sensory tool, allowing you to explore all the wondrous possibilities of Vermont maple syrup. Here are some hints for tasting on your own.

Smell the syrup before tasting. Try to identify any distinct *aromas*. Take a look at the list of **aroma and flavor** descriptors as a guide.

Take a small sip of the syrup. Move the syrup in your mouth briefly, and *feel* the texture. See the **mouthfeel** section for suggestions.

Then, evaluate the taste characteristics. See the **taste** section for suggestions. For all the sensory properties evaluated, always try to asses the *quality, quantity and balance* of the descriptors identified.



Consider the *flavor* with another sip. See if the sensory "families" help you place the aroma and flavor of the syrup, allowing you to identify and describe each particular maple syrup.

If possible, taste and share your reactions with a friend. Sometimes tasting and talking with others can help your descriptions.

why taste and tell?

Maple syrup is an old-fashioned yet long-lived taste of Vermont. Exploring the differences between Vermont syrups can capture the variety of delightful and delicious possibilities the state has to offer. Learning the qualities that make each batch of maple syrup unique helps create exciting new conversations where producers, retailers and consumers engage in identifying the aromas, flavors and tastes of your favorite syrup. Though you might use this tool in a variety of ways, we hope it can serve as a roadmap on a fabulous journey through Vermont's distinctive maple syrups.

"[When] you do sip your way through a few 'syrup flights,' you quickly realize that maple syrups are wildly different once you get beyond that great bear hug of sweetness." —**food writer Rowan Jacobsen in *American Terroir***

the taste of Vermont

This sensory map captures the delicious qualities of Vermont maple syrup. A team of researchers, sugarmakers and sensory panelists collaborated over several years by evaluating maple syrup from throughout the state of Vermont. It was jointly developed by the Nutrition and Food Sciences Department at University of Vermont and the Vermont Agency of Agriculture Food and Markets. Reseachers at Middlebury College were also involved. State funds for this project were matched with Federal funds under the Federal-State Marketing Improvement Program of the Agricultural Marketing Service, U.S. Department of Agriculture.

The University of Vermont

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the map of maple: off-flavors

mother nature	sour sap		ropey appearance citrus, soy sauce, fermented aromas sour taste thick, chunky mouthfeel
	metabolism		chocolaty, grassy aroma lack of maple flavor cardboard, popcorn, peanut butter flavors dry mouthfeel
	buddy		chocolaty aroma and flavors lingering aftertaste
defoamer	safflower and vegetable oils		vegetable aroma and flavor oily, waxy mouthfeel
	canola oil		spicy, peppery flavors walnut, pungent finish astringent mouthfeel
processing	burnt	scorch	burnt flavors (coffee, dark chocolate) thick body
		niter	burnt flavors (coffee, dark chocolate) leathery, spicy meat flavor chalky, gritty mouthfeel
	storage	fermented	yeasty alcohol aroma honey, fruity, spicy (soy sauce), vegetable flavors thin body foamy appearance (severe fermentation) effervescent mouthfeel
		metallic	tin can aroma strong metallic flavor (affects back tongue and teeth)
chemicals	minerals / niter		fizzy, gritty mouthfeel
	chloride		salty taste
	acid / basic		acid or caustic odor (depending on chemical) pungent, burning sensations
others	musty / mold		moldy, yeasty, vegetable aromas and flavors lingering finish (affects back tongue and throat)
	detergents		perfumy, floral aromas soapy flavor
	lubricants / fuels		petroleum aroma and flavor oily mouthfeel astringent finish

filters these defects could stem from misuse or mishandling of syrup filters

tasting maple syrup

The flavor and overall sensory quality of maple syrup can be influenced by multiple factors. Outside the sugarhouse, these include environmental conditions, location, and time in the season; inside the sugarhouse these include method of production, as well as filter and packaging conditions. This sensitivity makes the flavor of maple syrup susceptible to flavors not considered "typical."

This tool is meant to identify off-flavors in syrup, and link the particular sensory experience to a specific defect and category that explains why the defect has occurred. Additionally, this tool serves as a user-friendly representation of the Vermont Agency of Agriculture Farms and Markets (VAAFM) "Maple Syrup Off-Flavors" manual.

The descriptors on the right describe the aroma, taste and/or mouthfeel of the defective syrup (ex. "chocolaty aroma and flavors, lingering aftertaste"), paired on the middle column with the specific cause of defect (ex. "buddy"). The defects are then grouped by type of defect (example: "mother-nature") in order to better identify off-flavors, and to trouble-shoot future batches. The triangle in the lower left corner denotes a defect linked to misuse or mishandling of filters.

sampling your syrup

Smell the syrup before tasting, note any atypical smells. Consult the list of descriptors to match any atypical aromas to their potential causes listed on the left.

Taste the syrup, note of the taste and the mouthfeel. Repeat the process described above.

Evaluate the syrup. If the troubleshooting guide indicates, address any issues with filters or processing equipment.

the taste of Vermont

A team of researchers, sugarmakers and sensory panelists collaborated over several years by evaluating maple syrup from throughout the state of Vermont. The result was two sensory tools to help sugarmakers determine the quality of the maple syrup each season. It was jointly developed by the Nutrition and Food Sciences Department at University of Vermont and the Vermont Agency of Agriculture Food and Markets. State funds for this project were matched with Federal funds under the Federal-State Marketing Improvement Program of the Agricultural Marketing Service, U.S. Department of Agriculture.

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Results from the Maple Sensory Tool Post-Training Surveys

February 15, 2012

Section 1. Map of Maple

Question 1. How do you currently describe your maple syrup?

Responses

- At the CIFA (Canadian Food Inspection Agency) we have a grading work sheet where the most often encountered flavors (off or good) are indicated. The inspector can simply check the appropriate column describing the syrup under inspection;
- As packers, our syrup (both regular and organic) is described as a pure product. I say it has a nice smooth, clean maple flavor;
- All types, all grades, all flavors;
- I do not attempt to describe the taste of our syrup - there is too much variation day to day and year to year - therefore the description would change all the time and I believe might confuse the consumer. I would tell them there are variations and during the season and year to year but that would be it. I also think if the consumer is generally adding the syrup to other flavors - as in salad dressing or putting it on pancakes - the subtle taste differences are not meaningful. I think the different grades are enough for the average consumer to understand;
- I don't feel I have a standard approach or descriptions;
- Carmel, golden, delicious maplely flavor;
- "Delightful maple flavors;"
- I was involved with the Midd College from the start of this project. I was surprised with how this turned out. I sell the best syrup (in my opinion) to my customers and whole sale the rest;
- Fancy - light delicate taste; Med. - little more maple flavor, most popular; Dark - dark in color, robust in flavor ; B - very dark color, very strong in flavor, used as a cooking syrup but some people prefer it as a table syrup;
- Maple flavor - sweet and smooth - some creamy texture - a wide range of grades. Fancy - light maple, AM - good all-around maple with a more prominent flavor, AD - a little stronger maple, B - stronger maple good for cooking or table;
- Maple syrup is a unique product because of its grades and flavors;
- I try to make a syrup that not only correct density but also with a sharp flavor;
- Ribbon winning - full bodied - a little smokey - we use wood fire;
- 100% sold bulk;
- Light fancy – yummy;
- Sweet or maple tastes, might say smokey or strong but mostly just in strength of maple taste;
- Good quality all around; and
- Taste, color, texture, sweetness.

Question 2. How do you currently communicate that information to others?

Responses

- We can use the terminology from the map of maple, it can be very useful. At this moment, we use the wheel of flavors from MAPAQ, however I think it's a little too complicated to describe maple syrup;
- Mainly through word of mouth, but on some of our labeling as well;
- Marketing and sales;
- Only that Fancy is more subtle and the flavor intensifies as the grades are darker;
- Word of mouth, have to be with the person and have them sample it;
- On our jug, over the phone, on our website, in person;
- Website, phone calls, bed and breakfasts, taste testing at sugar house, taste testing at farmer's markets, general education of the public on the grades and different flavors and products we produce;
- Word of mouth, internet and handouts;
- I currently ask what they have an interest in using it for. Then help them find the grade that would suit them best;
- By explaining the difference in flavors and grade and uses;
- By offering them tastes;
- Word of mouth;
- We label grade, and any significant flavors are noted - either off or positive;
- Usually let syrup speak for itself;
- I don't, I'm merely a consumer;
- Records and samples; and
- Relate it to other foods.

Question 3a. Please examine the Map of Maple sensory tool and indicate your level of agreement with the following statements:

The design is aesthetically pleasing

Response	Frequency	Percent
Strongly disagree	0	0.0
Disagree	0	0.0
Neutral	3	15.0
Agree	13	65.0
Strongly Agree	4	20.0
Total	20	100.0

Question 3b. Please examine the Map of Maple sensory tool and indicate your level of agreement with the following statements:

The images effectively illustrate the categories of odor and flavor

Response	Frequency	Percent
Strongly disagree	1	5.0
Disagree	3	15.0
Neutral	5	25.0
Agree	9	45.0
Strongly Agree	2	10.0
Total	20	100.0

Question 3c. Please examine the Map of Maple sensory tool and indicate your level of agreement with the following statements:

The text size is easy to read

Response	Frequency	Percent
Strongly disagree	0	0.0
Disagree	1	5.0
Neutral	1	5.0
Agree	9	45.0
Strongly Agree	9	45.0
Total	20	100.0

Question 3d. Please examine the Map of Maple sensory tool and indicate your level of agreement with the following statements:

The descriptive terms evoke specific odors and flavors

Response	Frequency	Percent
Strongly disagree	1	5.0
Disagree	0	0.0
Neutral	5	25.0
Agree	12	60.0
Strongly Agree	2	10.0
Total	20	100.0

Question 3e. Please examine the Map of Maple sensory tool and indicate your level of agreement with the following statements:

The directions on the back for how to taste syrup are helpful

Response	Frequency	Percent
Strongly disagree	0	0.0
Disagree	0	0.0
Neutral	1	5.0
Agree	14	70.0
Strongly Agree	5	25.0
Total	20	100.0

Question 3f. Please examine the Map of Maple sensory tool and indicate your level of agreement with the following statements:

I could easily identify the characteristics of my syrup using this tool

Response	**Frequency**	**Percent**
Strongly disagree	0	0.0
Disagree	3	15.0
Neutral	7	35.0
Agree	9	45.0
Strongly Agree	0	0.0
No Response	*1*	*5.0*
Total	20	100.0

Question 3g. Please examine the Map of Maple sensory tool and indicate your level of agreement with the following statements:

My customers are interested in the unique qualities of my syrup

Response	**Frequency**	**Percent**
Strongly disagree	0	0.0
Disagree	1	5.0
Neutral	7	35.0
Agree	6	30.0
Strongly Agree	5	25.0
No Response	*1*	*5.0*
Total	20	100.0

Question 3h. Please examine the Map of Maple sensory tool and indicate your level of agreement with the following statements:

This tool would be useful for describing my syrup for marketing

Response	**Frequency**	**Percent**
Strongly disagree	1	5.0
Disagree	3	15.0
Neutral	5	25.0
Agree	8	40.0
Strongly Agree	2	10.0
No Response	*1*	*5.0*
Total	20	100.0

Question 4. I understand how to use the Map of Maple.

Response	Frequency	Percent
Yes	16	80.0
No	0	0.0
Not Sure	4	20.0
Total	20	100.0

Question 5. I would need more training to use the Map of Maple.

Response	Frequency	Percent
Yes	4	20.0
No	11	55.0
Not Sure	5	25.0
Total	20	100.0

Question 6. If you answered Yes to Question 5, then what additional training would be helpful?

Response
• More specifics on what to look for in identifying these flavors;
• How to relate the map back to grades;
• I need to get more experience using the terms. It is very helpful to have a vocabulary for the various flavors of syrup;
• I do not agree with the overall content;
• To me it just seems like a list of flavors that I could use to describe syrup. I do like the intensity range; and
• Actually testing the syrup.

Question 7. I would use the Map of Maple sensory tool to help me describe my syrup.

Response	Frequency	Percent
Yes	11	55.0
No	5	25.0
Not Sure	3	15.0
No Response	1	5.0
Total	20	100.0

Question 8. What would be your main reason for using the Map of Maple sensory tool? Select one.

Response	Frequency	Percent
To better understand the odor and flavor characteristics of my syrup	7	35.0
To differentiate my syrup from other sugarmakers' products	1	5.0
To better articulate the odor and flavor characteristics of my syrup to customers	5	25.0
All of the above	2	10.0
Upon customer request	1	5.0
Will not use tool	1	5.0
Not sure	1	5.0
No Response	2	10.0
Total	20	100.0

Question 9. After using the Map of Maple sensory tool to determine your syrup's sensory profile, how would you convey this information? Check all that apply.

Response	Frequency	Percent
List on product labels	4	20.0
Include in print marketing materials	7	35.0
Include on website	5	25.0
Post on social media	2	10.0
Use when talking to customers	12	60.0
I would not use this information	4	20.0

Question 10. Please feel free to add any additional comments about this maple syrup sensory tool.

Responses

- Some correlation between the flavors listed and the flavors expected and typical of each grade would be helpful;
- From past experience and from experience at the maple grading school - I think individuals taste too differently for this to be really valuable. There can be generalizations, but, overall, taste is individual. Consumers don't drink syrup like wine. I would prefer to concentrate on the natural and nutritional value of maple;
- Can it be made available in 5" x 7" size? Add relationship of grades as they relate to flavors on map and to each other. Change 'toasted' symbol. Great tool;
- Thank you for a great visual guide and a standardization of terms;
- Helping all of us understand the flavors of maple is a good thing;
- I would not use it;
- Very nice tool;
- I like how it's laminated, small, and clear;
- Education like this will help to elaborate on the flavor that most people generally just recognize as "sweet" and ultimately will be beneficial to industry as it creates a more informed and discerning consumer; and
- Great tool!

Section 2: Off-Flavor Map

Question 1. How do you currently identify off-flavors in your maple syrup?

Responses

- In Canada (QC) we use the wheel of flavors from MAPAQ (Quebec Gov.) We taste syrup at room temperature and usually consult colleagues to confirm off flavors;
- As packers, our syrup (both regular and organic) is described as a pure product. I say it has a nice smooth, clean maple flavor;
- As a packer will help me identify the cause of some of the off flavors we run into most every season;
- If I detected an off flavor - try to determine if something we are doing might cause it or if it is a mother nature off flavor;
- Need to learn more and experience more;
- By tasting warm and then room temp, then got our kids to taste it;
- Tasting in sugar house and again when we open drums;
- Taste hot and then cold;
- Smell/taste;
- By tasting;
- I taste the syrup by grade and each grade has different characteristics on how strong the maple flavor is;
- By checking the taste as I make it and pack it;
- Tasting, smelling;
- By taste, aroma, and appearance. Each bbl is tasted and sampled as well as monitored continuously during production. We are a large producer, and often boil over 1000 gal syrup/day;
- Simply by smelling and tasting;
- I never did, I'm a consumer;
- By taste, not necessarily knowing what it is but knowing it's not right; and
- Smell, taste, relating it to other flavors or smells.

Question 2. How do you currently go about correcting the defect?

Responses

- Mainly through word of mouth, but on some of our labeling as well;
- Off syrup is segregated from good and mixed in over time. Some is rejected outright.;
- Have not had to;
- Not a sugarmaker, but will reject syrup when/before purchasing from source;
- Sell as commercial;
- Sell as commercial;
- If problem at sugar house, correct problem. Tubing, filtering, storing, R/O, boiling, filter press, drums or canning process. Most recent was a faulty "new" filter press making cloudy syrup;
- Understand what it is and take corrective action to change what I can;
- If it is one that we can correct like too much oil/defoamer, we correct;
- By making sure that I do everything correctly and making sure that all my equipment for boiling and canning is clean and up graded;
- Use it in other ways;
- Smokey = the evaporator is very old and needs to be retired. The front doors don’t close completely;
- Our off flavors are generally naturally occurring and are not corrected - each bbl is labeled for our buyer. We watch closely for defoamer taste and any other possible off flavors;
- It is either saleable or not;
- I don't, I’m a consumer;
- By marking barrels or containers and possibly re-filtering; and
- Do not buy the syrup.

Question 3a. Please examine the Off-Flavor Map sensory tool and indicate your level of agreement with the following statements:

The design is aesthetically pleasing

Response	Frequency	Percent
Strongly disagree	0	0.0
Disagree	0	0.0
Neutral	2	10.5
Agree	15	78.9
Strongly Agree	2	10.5
Total	19	100.0

Question 3b. Please examine the Off-Flavor Map sensory tool and indicate your level of agreement with the following statements:

The text size is easy to read

Response	Frequency	Percent
Strongly disagree	0	0.0
Disagree	1	5.3
Neutral	0	0.0
Agree	12	63.2
Strongly Agree	6	31.6
Total	19	100.0

Question 3c. Please examine the Off-Flavor Map sensory tool and indicate your level of agreement with the following statements:

The descriptive terms evoke specific odors and flavors

Response	Frequency	Percent
Strongly disagree	0	0.0
Disagree	0	0.0
Neutral	3	15.8
Agree	12	63.2
Strongly Agree	4	21.1
Total	19	100.0

Question 3d. Please examine the Off-Flavor Map sensory tool and indicate your level of agreement with the following statements:

The directions on the back for how to taste syrup are helpful

Response	Frequency	Percent
Strongly disagree	0	0.0
Disagree	0	0.0
Neutral	2	10.5
Agree	12	63.2
Strongly Agree	5	26.3
Total	19	100.0

Question 3e. Please examine the Off-Flavor Map sensory tool and indicate your level of agreement with the following statements:

I could easily identify the off-flavors of my syrup using this tool

Response	**Frequency**	**Percent**
Strongly disagree	1	5.3
Disagree	1	5.3
Neutral	5	26.3
Agree	8	42.1
Strongly Agree	3	15.8
No Response	*1*	*5.3*
Total	19	100.0

Question 3f. Please examine the Off-Flavor Map sensory tool and indicate your level of agreement with the following statements:

This tool will help me increase the quality of my syrup

Response	Frequency	Percent
Strongly disagree	0	0.0
Disagree	0	0.0
Neutral	5	26.3
Agree	10	52.6
Strongly Agree	3	15.8
No Response	*1*	*5.3*
Total	19	100.0

Question 4. I understand how to use the Off-Flavor Map.

Response	Frequency	Percent
Yes	17	89.5
No	0	0.0
Not Sure	2	10.5
Total	19	100.0

Question 5. I would need more training to use the Off-Flavor Map.

Response	Frequency	Percent
Yes	2	10.5
No	16	84.2
Not Sure	1	5.3
Total	19	100.0

Question 6. If you answered Yes to Question 5, then what additional training would be helpful?

Response
• Needs more experience tasting off-flavors and using the map; and
• I understand how to use the map but I need mileage to help apply the terms. The map has given me an easy reference of terms to apply to syrup. Very helpful. Many Thanks.

Question 7. Please feel free to add any additional comments about the Off-Flavor Map.

Responses

- I would like to see on the off-flavor map a few indications on HOW off flavors appear in maple syrup to help identify with what is noticed at the producer during inspection;
- A good tool for field use and for helping producers identify sources of issues;
- Experience at Maple Grading School - individuals have lots of variation on what they can detect or taste. Ex: one person could not pick up on the metabolism flavor at all, others could not detect defoamer/veg oil - or they experienced the flavor differently - This makes it challenging;
- Great tool;
- Great reference and guide. Again Thanks!
- This is helpful it encourages people to be more critical of syrup flavors;
- Off-flavor map I think will be more useful for us than Map of Maple, we are a small producer;
- A very good resource. Informative, even if I don't produce syrup; and
- Maybe add some images?

Senses and Sensibility: Tasting Place in Vermont Maple Syrup and Farmstead Cheese

Dr. Amy B. Trubek

November 9, 2011

Taste of Place

- A sensibility?
- A sensory reality?
- A relationship between human communities and natural environments?
- An intervention into a global food system?
- All of the above?

Taste: More than Psychology and Physiology

"Sensation is not just a matter of physiological response and personal experience. It is the most fundamental domain of cultural expression, the medium through which all the values and practices of society are enacted."

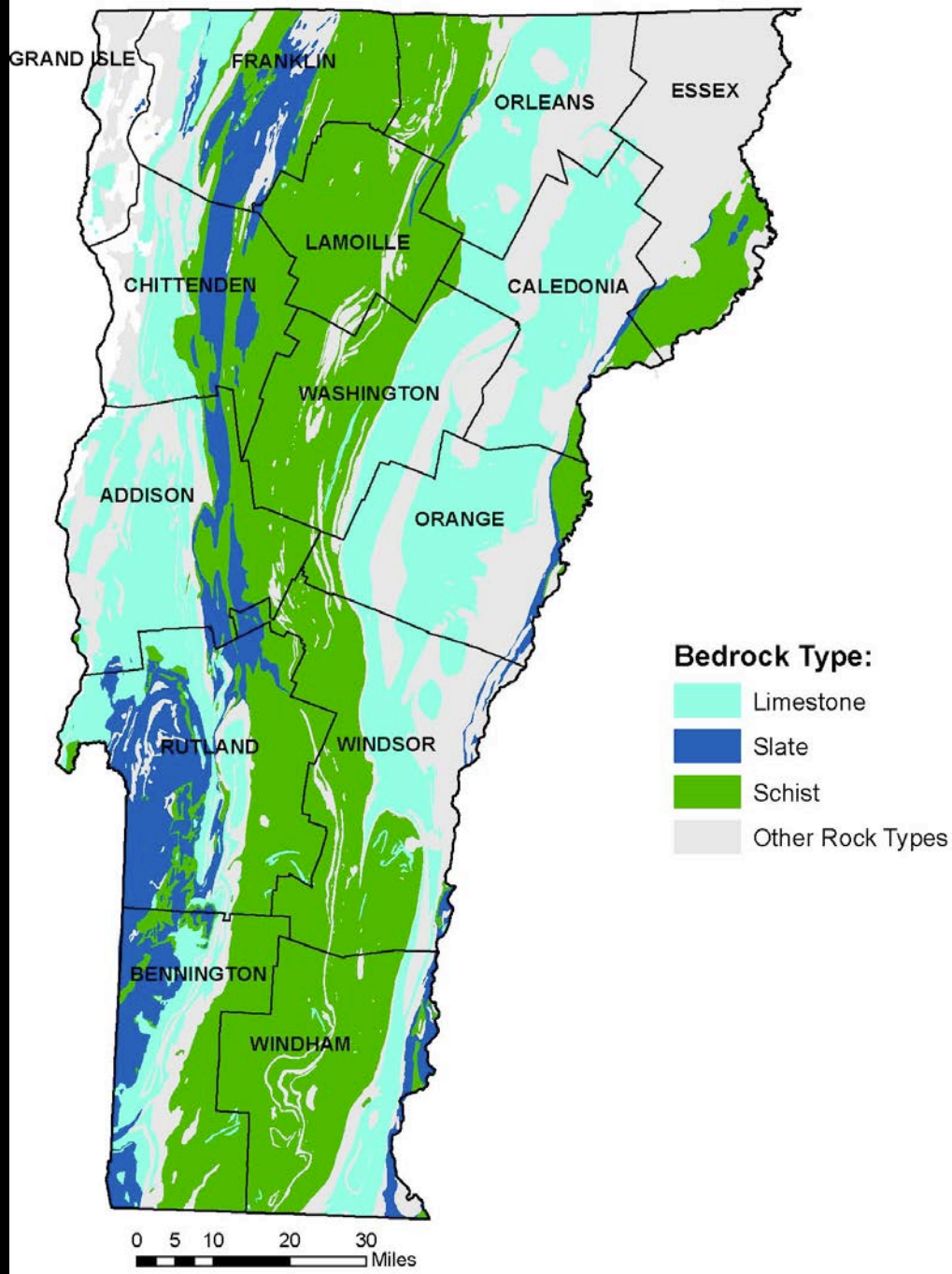
David Howes, *Sensual Relations: Engaging the Senses in Culture and Social Theory*

222. In the Sugar Bush. Sugaring off.

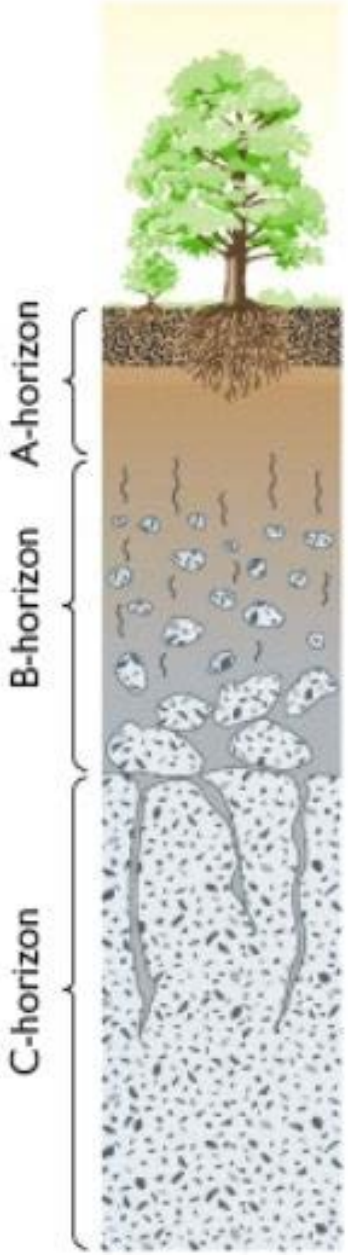
“I’d have to stress the maple flavor and a lot of body to it. It’s the same as anything. People taste today or eat today, but do they taste? You put the syrup in your mouth and you swallow it. You should have a good, sweet maple taste afterwards.”

-sugarmaker Francis Howrigan

Bedrock Geology of Vermont



Soil Profile



Topsoil (rich in organic matter)

Soil leached of soluble minerals; rich in clay and insoluble minerals

Little organic matter; dissolved minerals from A-horizon precipitated

Bedrock cracked and weathered

http://www.gly.fsu.edu/~salters/

ID #4
DAY #2
SYRUP
ID #16
DAY #1
SYRUP

the map of maple

intensity →

aroma and flavor

maple	maple	
toasted	baked apple brioche golden sugar crème brûlée	toasted nuts roasted marshmallow burnt sugar caramel coffee
milky	fresh butter condensed milk	melted butter butterscotch
confectionary	light brown sugar molasses	dark brown sugar toffee
spice	vanilla nutmeg	cinnamon mixed spices
fruity	raisins orange peach mango raw nuts	prunes grapefruit apricot
floral	honey floral blend	
earthy	grassy oats mushroom	hay
others	praline bourbon spiced meat mineral notes	dark chocolate soy sauce leather

© University of Vermont

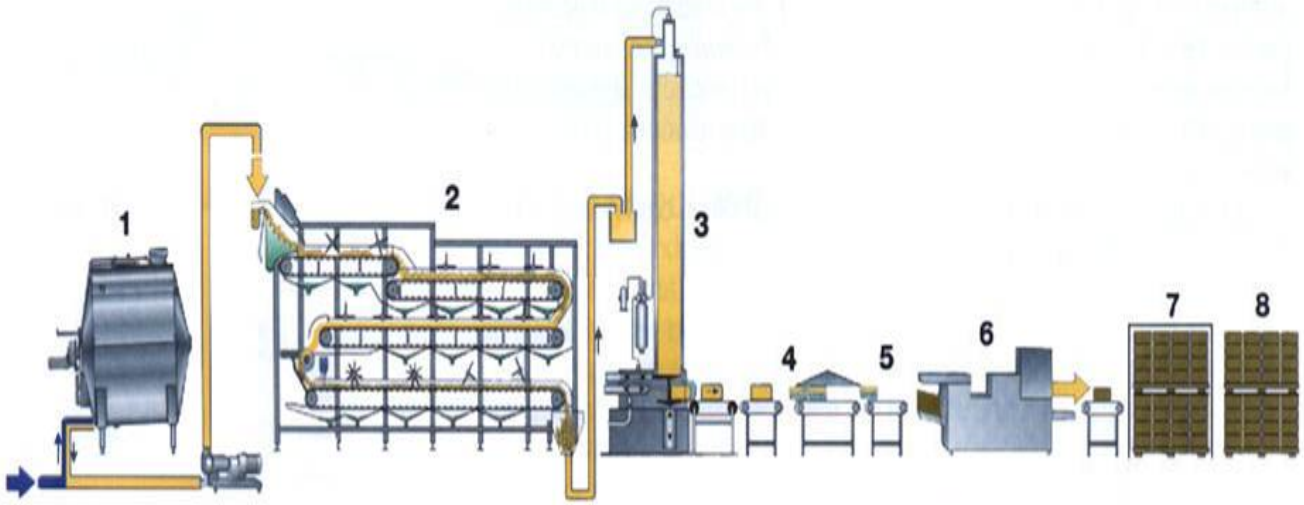
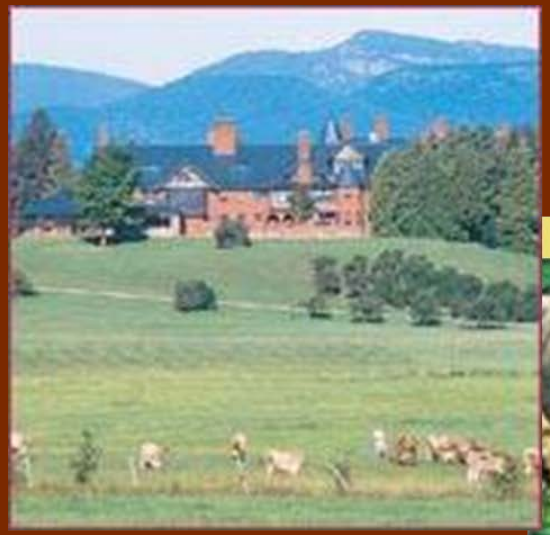


Fig. 14.35 Flowchart for mechanized production of Cheddar cheese.

1 Cheese vat
2 Cheddaring machine
3 Block former and bagger
4 Vacuum sealing
5 Weighing
6 Carton packer
7 Palletizer
8 Ripening store

Milk
Curd/cheese



Top Commodities in NE

Maine:

1. Potatoes 21.7% SR
2. Dairy Products 21.3% SR
3. Chicken/Eggs 19.6%
4. Aquaculture 11.3%
5. Blueberries 6.4%

Vermont:

1. Dairy products 76.4%
2. Cattle 8.9%
3. Greenhouse 3.4%
4. Hay 2.1%
5. Maple Products 2.0%

Maryland:

1. Broilers 35.0% SR
2. Greenhouse 17.0%
3. Dairy 13.7%
4. Soybean 5.1%
5. Cattle 4.0%

New York:

1. Dairy products 56.1%
2. Greenhouse 8.9%
3. Cattle 4.0%
4. Apples 3.9%’
5. Hay 2.8%

Taste: A Sense, A Context, A Value?

- A cultural category
- A concept of quality
- A sensory experience
- A new environmental ethic
- An institutional intervention into the food system