“The uniqueness of one apple versus another.” Exploring producer perspectives of hard cider in the Northeast and Mid-Atlantic United States

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Hard cider is growing in popularity throughout the United States (US). Though many scholars have investigated quality and trends in the expanding US cider industry, still little is known about cider producers’ opinions of the products that they make. How do American cider producers value and emplace value onto cider as the industry grows and competes with the broader alcoholic beverage market? This study explored producer perceptions of American hard cider by employing 21 semi-structured interviews with cider-makers throughout Virginia, Vermont, and New York – three leading cider producing states in the Northeast and Mid-Atlantic US. Interview sessions were subject to reflexive thematic analysis for themes related to preference, consumption, and cider-making. Results suggest that cider producers broadly prefer complex flavors and cider made with cider-specific apples. Yet, cider producers ascribe to a diverse spectrum of values related to the cider-making process, agriculture, and business goals, which influence their preferences and the experiences that they create for other consumers. This research also identifies a chasm in how American “cider” is being constructed and valued, offering broad implications for the domestic cider and apple agriculture industries as well as a template for bridging the divide between producer- and consumer-based food studies.

Keywords: cider, producer, sensory quality, apple, artisan

Introduction

Alcoholic cider, known as hard cider in the United States (US), is growing in popularity worldwide (Bundele and Deshmukh 2022) and particularly experiencing a renaissance in the US (Fabien-Ouellet and Conner 2018; Jacobsen 2021; 2022; Kline and Cole 2017). Recently, small and regional brands have started to outcompete national staple brands (Lombardo 2020; Wood 2022). In the Northeast and Mid-Atlantic US, the number of cider producers has increased substantially (Brager 2019) due in part to the region’s rich apple-growing and cider-making history (Calhoun, Jr. 2010; Pucci and Cavallo 2021; Smith and Lal 2017). As reported most

recently, New York, Virginia, and Vermont rank 1st, 8th, and 12th respectively, as states with the most cideries (Conway 2019; 2020; E. West 2018).

The Alcohol and Tobacco Tax Trade Bureau defines a finished cider product in the US as a beverage made from 50% apple juice or apple juice reconstituted from concentrate (Electronic Code of Federal Regulations, n.d.), a relatively loose standard compared to other alcoholic beverages. Cider can be made via a broad range of production methods – all of which can potentially influence the quality of the end product. Cider can also be made from many different types of apples which are traditionally classified as either dessert apples (known for their sweetness), cooking apples, or cider-specific apples (intended for fermenting into cider). Cider-specific apples have been historically prescribed for cider-making because they can contribute complexity, bitterness, astringency, and body to a cider beverage (Alexander and Ewing Valliere 2020; Calhoun, Jr. 2010; Lea 2008; Proulx and Nichols 1980). Apples are analogous to grapes used for winemaking: geography, orchard practices, seasonal climate, and many other factors can impact the sensory expression of an apple and the ultimate cider (Brennan 2019; Merwin, Valois, and Padilla-Zakour 2007; Proulx and Nichols 1980).

To date, researchers have attempted to investigate cider quality through the lens of chemistry (Boudreau et al. 2017; Ma, Neilson, Lahne, Peck, O'Keefe, and Stewart 2018; Ma, Neilson, Lahne, Peck, O'Keefe, Hurley, et al. 2018; Rosend et al. 2019; 2020; Thompson-Witrick et al. 2014), cider production and processing methods (Alexander et al. 2018; Keller et al. 2004; Techakanon and Sirimuangmoon 2020), fermentation techniques (Calugar et al. 2021; Cousin et al. 2017; Littleson et al. 2022; Rosend et al. 2019; Valles et al. 2007), sensory quality (Kessinger et al. 2020; Littleson et al. 2022; Phetxumphou, Cox, and Lahne 2020), and consumer preferences (Cole et al. 2022; Smith et al. 2021; Tozer et al. 2015; Yenerall et al. 2022).

Recently, researchers have also studied cider producers to gain a better understanding of supply chain issues and potential areas for growth in the US cider industry (Fabien-Ouellet and Conner 2018; Miles et al. 2020; Ostrom et al. 2022). Yet, how cider producers understand and define cider quality has thus far remained unexplored.

The current research aims to use phenomenological research methods and reflexive thematic analysis to explore how a sample of professional cider producers in the Northeast and Mid-Atlantic US view cider quality and the cider-drinking experience. This paper reports on the methodological approach and findings of semi-structured interviews in order to develop a contextualized understanding of *how* producers in the Northeast and Mid-Atlantic understand hard cider quality and *why*.

Cider

Apples have been grown throughout North America for centuries because apples offer a variety of uses that were important for sustaining early US colonists. Fermenting apple juice into hard cider created a proliferative beverage that was well-liked, food safe, and commonly consumed. Though much of cider's early cultural identity in the US remains undocumented, the factors that facilitated cider's downfall are more well-known. Starting in the 19th century, multiple forces contributed to American cider's downfall including waves of German immigrants with their beer-brewing traditions, Prohibition, and pests and disease (Watson 2013). In the 20th century, apple agriculture in the US shifted to favor large production volumes of easy-to-grow, -eat, and -store apples, with a reduced focus on apples intended for cider-making (Futrell 2017). Simultaneously, importing juice and juice concentrates became more affordable and easier (Futrell 2017). Coming into the 21st century, the US cider industry has been marked by many large, commercial orchards growing primarily table apple varieties and a low supply of apples

for cider-making (Becot, Bradshaw, and Conner 2016; Fabien-Ouellet and Conner 2018), heirloom apple varieties becoming rare or completely extinct, labor shortages and discrepant pay for orchard and cider-production staff (Weiler 2021), and the use of apple juice concentrate for cider production (Miles et al. 2020). At the same time, however, apple agriculture and cider production are becoming recognized as profitable and sustainable entrepreneurial endeavors that can support a meaningful livelihood (Becot, Bradshaw, and Conner 2016; Peck and Knickerbocker 2018; Smith and Lal 2017).

Why study producers?

Understanding how producers view their products from the perspective of consumption is a novel approach to food systems research. A considerable amount of sensory and economics research in the food sector has explored consumer preferences for products because these findings are believed to be useful to producers making new and satisfying products (van Kleef, van Trijp, and Luning 2005). In contrast, investigations into the social networks of production and consumption within agricultural and commodity studies have often separated "how we grow food" from "how we know food" (D. Goodman and DuPuis 2002, 6), with most producer-oriented research focusing on how and why producers make and share food products (Warde 2016). This simplistic overview has been described as a "production-consumption debate" wherein producers and consumers are treated as two distinct, separate entities competing for the power to influence each other; contributing to a dueling, non-empathetic food system (M. S. Carolan 2011; D. Goodman 2002; D. Goodman and DuPuis 2002; Guthman 2002; Warde 2016). While there is no established method for escaping the production-consumption debate (Warde 2016, 14), some research has attempted to interrogate what producers define as both 'good' and 'bad' production (M. Carolan 2022; M. K. Goodman, Maye, and Holloway 2010; Lahne and

Trubek 2014; Paxson 2013; Trubek 2008), as well as what these sentiments convey to consumers. Though understanding how and why producers make food and beverage products 'good' for both their business and their livelihoods is increasingly being explored, more focus should also be given to questioning how producers "know food" in the context of *their* consumption and how *this* has the potential to impact consumers.

Producers are often assumed to be extremely educated and experienced in the industry in which they engage; but they can also be new to their industry, transferring the ethics and ideals of their other careers and prior lifestyles into their newfound industry. As such, different producers may have evolving definitions of quality in terms of what they make, how they make, what they consume, and how they consume. Sensory research has been critical for exposing the ways in which expertise influences how one discusses and prefers foods and beverages (Ballester et al. 2008; Hopfer and Heymann 2014; Langlois et al. 2011; Schiefer and Fischer 2008; Lira Souza Gonzaga et al. 2020; Wang and Spence 2019). Using the growing, renewed US cider industry as a platform for investigating the consumption perspectives of producers, this work aims to expose how producers influence food views beyond simply making products to begin with.

Methods

Interview sessions were conducted throughout Virginia, Vermont, and New York between February and August 2021. Interview participants were recruited via direct email, and all research sessions for this study were approved by the Virginia Tech Institutional Review Board (IRB # 20-880). All subjects gave their informed consent for participation. Individuals qualified for participation by being a professional cider-maker for a commercial business (i.e.,

hobbyist cider-makers were excluded); participants of any age, level of experience, and scale of production in cider-making were included.

Most interviews occurred in-person at the respective cider-maker's cidery or taproom. Producers were asked to complete a brief, optional demographic survey with questions related to age, gender, and years of professional cider-making experience. In cases where it was not convenient or safe for the cider-maker to have an interview at their facility (due to the COVID-19 pandemic), interviews occurred via Zoom. All interviews were moderated by the first author (MDC), audio-recorded, and transcribed. Interviews followed a semi-structured questioning route, provided as *Supplementary Material I*, which asked questions about the cider-making process, economic factors relevant to the cider industry, historical barriers to inclusivity in the cider industry, and valued sensory qualities. Recent research and evidence in the popular press suggest that all of these factors are important components of the current cider and broader alcoholic beverage industries (Brennan 2019; Ostrom et al. 2022; Sugrue and Dando 2018).

Data Analysis

After transcription of all sessions, data was analyzed using NVivo 12 software (QSR International Pty Ltd. 2020). Data analysis used an inductive approach, exploring themes conveyed through the participants' discussions without a pre-established theory. The researchers aimed to uncover producer preferences and perspectives that encompass and extend beyond the moment of cider consumption. Data analysis followed the steps of reflexive thematic analysis (Braun and Clarke 2006; 2013): familiarization, coding, developing themes, and writing. All interviews were transcribed verbatim by the first author (MDC). First author familiarized herself with the data by reading all transcripts and re-listening to all audio-recordings, and subsequently generated both initial codes and secondary sub-codes. Last author (JL) read all interview

transcripts for familiarization. Together, first and last authors discussed all relevant codes and supporting quotes to generate overarching themes. During the writing process, themes were refined further primarily by the first and last authors. All other authors contributed to writing and editing.

Results & Discussion

A total of 21 professional cider-makers participated in 20 interviews (6 in Virginia, 5 in Vermont, 9 in New York), ranging in length from 37 to 77 minutes. One interview included two cider-makers who shared one cidery together, and one interview transcript was lost due to poor internet connectivity at the orchard where the interview took place. Of the cider-makers that participated in an interview, 3 were female and 18 were male. Cider-makers reported a range of 1-23 years of professional cider-making experience, with an average of 7.5 years.

Four primary themes summarize the cider-makers' varied perspectives of the cider industry as a whole, as well as their preferences for cider and the cider-drinking experience: ***The Drinking Occasion***, ***Flavor Ranks Supreme***, ***Value in a Story***, and ***Apple Economics***. Within the three latter themes, the cider producers' varying approaches to cider-making overflowed into their beliefs about flavor, product information, and the agricultural economics embedded within the cider industry and drinking experience. Therefore, we begin with a discussion of ***Cider-Making Philosophies*** which were heavily influential on the themes that we identified. This is then followed by discussion of the four dominant themes and their respective subthemes. We also provide excerpts from producers' loquacious discussions, contextualizing how cider-makers' preferences relate to each other, consumer perspectives, sensory science, and other social and economic theories relevant to the food and beverage industry.

Cider-Making Philosophies

Cider-makers had broad, varying philosophies on how cider should be made and the purpose of their cider. Just as the American Cider Association (ACA), the industry's leading trade group, and other stakeholders have pioneered "modern" versus "traditional" styles of cider (Alexander and Ewing Valliere 2020; United States Association of Cider Makers 2018), cider producers discussed in depth how cider styles closely parallel approaches to cider-making. We describe the approaches, or philosophies, of cider-making as a spectrum because many producers often had opinions that hybridized both modern and traditional approaches given their individual access to resources, economic position, social embeddedness within the community, and their business goals.

The Purist Approach

In the "traditional" or "purist" approach to cider-making, producers utilized primarily cider-specific apples and concerned themselves with how and where those apples were grown. These producers often preferred apples to be grown sustainably and biodynamically. Many purist cider-makers also advocated for more regulation in the cider industry in order to separate products that are made with fresh apples versus products made from juice concentrate or made with other added ingredients. These sentiments were expressed passionately by NY_Producer01, *"the thing I want the most for cider is for it to be more transparent than it is, and it is deeply unfortunate that things can be called cider and only have 51% apples and apple based products and it's outrageous,"* and NY_Producer08, *"but the stuff that's half concentrate base stuff and half artificial flavors, that shouldn't even be called cider."* Purist producers either disliked flavored ciders – noting how they *"always feel like a novelty"* (NY_Producer01) and how *"the*

varieties themselves is what creates flavors" (NY_Producer08) – or preferred to use only natural adjuncts, such as native herbs, fruits, or botanicals in their products: *"I would like to work more with infusions… using herbs, whether it be lemon balm, African blue basil, mint… doing something like that rather than an adjunct"* (VA_Producer12). These producers were adamant overall about not letting adjunct flavors overtake the natural integrity of a cider: *"Our philosophy is the cider should speak for itself and not be upstaged by additions to it. So if the additions complement it and enhance the flavor and don't overpower it, we're open to trying it out"* (NY_Producer03).

Following these sentiments, nearly all purist producers emphasized how little they aimed to intervene with the cider process: *"It's not a matter of what I do to it, it's a matter of what I don't do to it"* (VA_Producer15). This perspective often referred to the thoughtful use of sulfites, the avoidance of exogenous acids or tannins, and the intentional use of filtering or fining agents and yeast nutrients: *"Remove myself from the process as much as possible, minimal inputs…I would love that. Right now, I use a little bit of commercial yeast in part of the product. But I would like to move toward using wild yeast more and more. I use a little bit of sulfites but it'd be great to use less sulfites"* (NY_Producer07). Producers tending toward the purist approach often wanted their cider *"to communicate with consumers the beauty and uniqueness of a place where apples are grown"* (NY_Producer01). Ultimately, these producers wanted to manipulate the cider fermentation process as little as possible in an attempt to facilitate the expression of *terroir* – the French term for "the taste of place" – in the ciders that they made. These ideals are indicative of artisan approaches to food and beverage production, where artisan foods can be linked to "minimalist" or empirical modes of production in order to convey authenticity (Leissle 2017; Paxson 2013). Of note, many purist cider producers were often not reliant on their cidery

for an income or were less motivated by purely business success, and these producers were less interested in appeasing consumer desires with the products they made. Rather, these producers were often intrinsically motivated by their personal interest in the cider-making process or using the resources of their land. We discuss these value-systems more in depth in later sections.

The Experimentalist Approach

In contrast to purist cider-makers, we term the other main group of cider-makers "experimentalists" because these producers enjoyed experimenting with adjuncts and the cider production process. Experimentalist producers seemed to drive modern style cider production because four interviewees made exclusively modern style cider. Many experimentalist producers preferred to use table or dessert apples for cider-making because these types of apples contributed lower tannins and less complexity, making them more conducive for flavoring. These producers were interested in the craftsmanship of combining and creating different flavors in cider, regardless of the where those flavors originate: *"I'm just trying to explore really interesting flavors, and I see the apple as a great vehicle for flavors because… you're starting with fruit and cider is pretty thin to begin with"* (NY_Producer04). In such, these producers often spoke about how the lack of clear guidelines and regulations in the US cider industry allows them to be creative with the use of adjuncts. One producer specifically emphasized his desire to see the cider industry expand beyond the minimalist, traditional approach to cider-making, saying *"I think the industry has to open up more to what cider is or what it can be"* (NY_Producer02).

Of note, many experimentalist-leaning producers aimed for consistency in their products from batch to batch and season to season. From a business perspective, they often emphasized a desire to *"capture a certain demographic"* (VT_Producer17) or follow *"what's trending"*

(NY_Producer04). Many of these producers emphasized how flavored ciders are more profitable: *"adding adjuncts, adding hops, adding other fruits… those are the products that often enable producers to do some of these finer small higher value more premium things"* (VA_Producer14). In other words, these producers paid more attention to profitability and business growth in producing ciders that appealed to consumers, even if that meant going against their own preferences: *"I don't typically drink sweet cider, I don't really like sweet cider, but we could be a tenth of our size making only dry cider and kind of struggling as a business, or we could be giving people what they want, and people like sweet"* (NY_Producer10).

In contrast to purist cider-makers who value the seasonality and *terroir*-based elements that cider can typify, one experimentalist cider-maker valued the extensive shelf-life of apples which provided flexibility with the cider-making process: *"Apples are storable all year long… you can be putting up a fermentation every two weeks all year long."* (VT_Producer17). Two other cider-makers emphasized the sustainability of using dessert and table apples in cider: "*cider exists as a recovery for apples that can't be sold at fresh market"* (VT_Producer17). Lastly, two experimentalist cider producers used juice from concentrate for cider-making as opposed to fresh apple juice. These findings are consistent with other research suggesting the use of juice concentrate in American cider (Miles et al. 2020; Ostrom et al. 2022; Raboin 2017; Snyder 2018); however, the total number of cider producers in the US that rely on apple juice concentrate for making cider is not well-documented.

The Middle of the Spectrum

A spectrum of cider-making philosophies creates space for those producers who hybridized both purist and experimentalist approaches. For example, some producers made traditional style ciders that highlighted specific apple varieties or apples from specific places,

and flavored products or those made using experimental methods. One such producer cited a philosophy of using apples: where rare or wild-foraged apples deserve minimalist, purist processing into cider (i.e., no added sulfites) while commercially grown fruit can rightly have anything added to it to enhance overall flavor. Still, some producers advocated that even if they just want to create a good base for fermentations, they strive to maintain some standard of apple quality: *"What I've learned in the cider industry is if I'm going to concentrate on heritage styles, traditionals the apples are more important… if you're going to add adjuncts, you just need a good base."* (NY_Producer02). This ethos of cider-making, heavily rooted in the quality and integrity of the apples, is comparable to that described for artisan cheese-making by Lahne and Trubek (2014), H. G. West et al. (2012), and Paxson (2013); moral values about how apples should be treated or how apples are grown are then carried through into cider-making. Wild, rare, or untreated apples undergo a "minimalistic," "hands-off" process, while commercially grown, domesticated, sprayed, or fertilized apples undergo an equivalently manipulated, commercialized cider-making process. Middle-of-the-spectrum producers prioritize the flexibility to make some products over extended periods of time with exclusively cider-specific apples and unique production methods, and other products with wholesale dessert apples, non-apple adjuncts, and different domesticated microorganisms – both of which *types* of products they enjoy making and drinking. In doing so, these producers are able to expand their repertoire of cider products and adjust what they make based on the raw material to which they have access.

These examples of how producers vary in their approaches to the cider-making process are pertinent because each cider-maker's approach influenced their understanding of cider quality and the growing cider industry. For the burgeoning hard cider industry, this may imply

that there is a diversity of definitions of hard cider quality alongside a plethora of hard cider options in the marketplace. We elaborate upon these ideas in proceeding sections.

Flavor Ranks Supreme

When asked what makes a cider "good" or "bad," cider sensory qualities were a top priority. Foremost, producers spoke at length about their desire for *balance* – of acidity, sweetness, tannins, and alcohol. Alcohol should not be too strong in a cider, making it "hot" and masking other flavors, and a cider should not be both intensely dry and acidic at the same time: *"there's so many different ways you can do balance. It could be bone dry, but then it needs acid, or it could have sugar left in it but then it really needs some tannins, to balance"* (NY_Producer08). These findings highlight the importance of bitterness, astringency, dryness, sweetness, and acidity in the cider sensory experience, which are also all well documented features of the wine sensory experience (Fontoin et al. 2008; Ishikawa and Noble 1995; Martin, Minard, and Brun 2002; Nolden and Hayes 2015; Symoneaux et al. 2014). Though some producers noted that they can *"still appreciate a well-made sweet cider"* (VA_Producer11), all producers emphasized a preference for dry cider.

At the same time, many cider producers appreciated relatively low levels of "funky" and "acetic" flavors for their ability to create a rounded, overall "good" flavor. Producers widely believe that these flavors, when not dominant, add to the "chord" of a good cider; however, producers also emphasized with consensus that intense faults or flaws can make a "bad" cider. These findings are consistent with Alexander and Ewing Valliere's description of traditional ciders, which can include some non-dominating spicy, smokey, farmhouse, cheese, butter, olive, and phenolic flavors (2020, 34). Off-flavors that producers explicitly described in cider included: "watery" or "weak" overall flavor, "fingernail polish" and "sulfuric" aromas, "plastic" or

“rubbery” flavors, intense sweetness, intense “acetic acid” flavor, intense “wood-like” flavors, “metallic” flavors, and clearness. The observation that producers so easily and confidently seem to separate “good” flavors from “bad” flavors, and yet simultaneously believe some quantity of “bad” flavors to contribute an overall pleasing flavor profile suggests that more research is needed to understand the concept of “sensory quality” when applied to hard cider. At what point does something go from “good” and “complex”, to “bad” overall?

One producer also expressed concerns over how the range of technically faulted sensory qualities in the cider marketplace makes it hard to discern standards of quality in the industry as a whole. These sentiments closely mirror those of the artisan cheese industry wherein variation within products can stem from material or environmental conditions (i.e., *terroir*) or poor workmanship, and that the two root causes can be easily conflated without clear sensory quality standards (Paxson 2013, 155). Evidence of producers appreciating low levels of traditionally faulted sensory qualities (Lea 2008), but also disliking other flavors with consensus suggests that more research may be pertinent to define cider sensory faults, their origins, and methods for controlling them.

At the same time, many producers noted that they want a cider with various aromas and flavors, *“some kind of tension”* (NY_Producer08), and something that makes you stop and think, much like a *“beautiful composition”* (NY_Producer09). Producers wanted the sensory experience with cider to linger and change as the beverage is consumed. As one cider-maker described, *“Cider is subtle and so to appreciate it you got to not expect it to hit you over the head”* (NY_Producer09), which is to say that when drinking cider, one must pay attention. In this way, most cider producers seek a rich, thought-provoking experience from cider that allows them to actively engage with and reflect on the flavors that they experience, aligning with

Hennion's description of active and reflexive taste experiences (2007). Cider producers, acting as a type of *amateur,* or experienced taster, attune their palate to the complexities that cider can offer; deciding what is too much, what is just enough, and what is lacking. In turn, they create a community of *amateurs* who collectively favor a complex, layered sensory experience (Hennion 2007; Teil and Hennion 2018).

Interestingly, cider-makers were divided in their views of cider tasting like apples: some cider-makers did not want apple-y flavor in cider, saying *"we don't expect wine to taste like grapes"* (VT_Producer20), while other producers did, saying *"wine does not taste like grapes, sure, but when I drink cider I want it to taste like apples"* (VT_Producer19). This discordance in how producers expect cider to taste like or unlike its raw material contrasts expectations of the wine industry wherein *Vitis vinifera* grape breeds are expected to produce wine that does not taste like red or white grape juice (Benucci 2020; Sun et al. 2011).

Value in a Story

In attempting to describe "good" and "bad" cider in terms of sensory quality, cider producers often derailed into discussion about apple varieties, production processes, and the place from which a cider was made. These artifacts of the apple-to-cider transformation culminate into what we term the "cider story." Many cider-makers made clear their preferences for ciders that convey the apple-to-cider transformation. When asked what he values in a cider, one producer said, *"a cider that's interesting so one that's a little different, that I can maybe learn something from…"* and when asked what he could learn from a cider, he responded, *"ciders that draw from a specific region… I am curious about what is the difference between dry cider that uses all Virginia apples versus a dry cider that uses all Maine apples… I'm interested in single varietals because you can taste the uniqueness of one apple versus another. I like*

interesting processes" (NY_Producer06). Still another cider-maker said that *"the story was in the process"* (NY_Producer04), in referring to traditional-style cider; confirming that how a cider product is made translates to the cider story. Altogether, elements of the cider story that producers discussed and closely related to the cider sensory experience included *terroir*, the apples (varieties, how they were grown, the history of different varieties), and fermentation and other production methods.

Terroir

Being the main subset within the "cider story", *terroir* was valued by many producers: "*what I love about cider is… that it is an opportunity to… communicate with customers the sort of beauty and uniqueness of the place where those apples are grown"* (NY_Producer01). Specifically, these producers wanted to better understand how both place and practice influenced cider flavor. Many cider producers emphasized the need for "traditional" cider-making practices and transparency about those practices in order to allow the taster, whether that be themselves or the consumer, to fully experience *terroir*. These observations of how producers consider production processes in their understandings of *terroir* is consistent with previous discussions on the need to consider human factors of production in determining the authenticity of *terroir* in food and beverage products (Trubek 2008). Transparency in the human elements of cider production (i.e., the cider-making process), as well as the natural elements (i.e., geography) is important for the industry to avoid unsubstantiated marketing claims about *terroir* in cider, as has become a topic of concern in the artisan cheese sector (Paxson 2013, 196).

Apples are the raw material used to make cider, and so are a key contributor to the formation of *terroir* in cider. Some cider-makers specifically valued where apples were sourced from or grown; defining good cider as cider *"grown in a good terroir, which the Hudson Valley*

does offer" (NY_Producer03). Uniquely, by asserting that *his* geography of production is inherently "good," NY_Producer03 and other producers with similar beliefs confirm various scholars' assumptions that locating cider incorporates emotional, possessive elements into the *terroir* concept, which can allow people to understand taste in new ways (Daynes 2013; Trubek 2008, 12). Other cider producers enjoyed reflecting on the different flavors of individual apple varieties and how these flavor differences can vary depending on the growing region: *"I think as a cider maker it's really interesting because then you can see, okay, there's a [apple] variety I'm familiar with but it's from down the road and so they treat it differently and they got this really different result."* (NY_Producer09). This reiterates how cider producers simultaneously engage with both regional and human elements of *terroir* by acknowledging the geographical origins of apples and how they are transformed into cider in different ways by different producers (Trubek 2008). Many cider producers wanted to have a better understanding of apple varietal character, often discussed and elaborated upon in the context of wine as typicity (Ballester et al. 2008; Leriche et al. 2020; Lira Souza Gonzaga et al. 2020; Trubek 2008). Typicity is a phenomenon wherein sensory characteristics of a product are an extension of factors related to the raw material; however, a comprehensive understanding of varietal typicity in ciders is severely limited and inconsistent (Dawson et al. 2019; Littleson et al. 2022; Nicolini et al. 2018; Rosend et al. 2019; Soomro et al. 2022). Recently, *varietal* typicity has been specifically demonstrated to be an important factor in consumer choice for wine, a trend that may have implications for the cider industry as well (Kustos et al. 2019; Perrouty, d'Hauteville, and Lockshin 2006; L. Souza Gonzaga et al. 2021).

However, not all cider-makers valued *terroir* and varietal typicity in the products that they make and consume. Some producers viewed the lack of variety- and production-specific

expectations as conducive to creative expression with cider-making: *"There's so much documented understanding of different varietals, different growing regions, and different methods of winemaking, what the outcomes are. I feel like there's just a fraction of that in cider and the fun thing about that is there's no real cultural stigma as to what cider has to be"* (VA_Producer15). In discussing where his modern-style cider fit into the American cider marketplace, another cider producer said, *"Why can't something people made still be good regardless of where the fruit comes from?"* (NY_Producer10). These diverse preferences suggest a discordance among cider producers in regard to defining cider quality based on factors such as *terroir* and varietal typicity.

Production Elements

Producers also spoke at length about how apples and other cider production processes were integral to cider quality overall. Dessert apples were widely believed to make "bland" cider: *"dessert juice can come out two dimensional, once you ferment it out…There's nothing to it."* (VA_Producer13); *"Dessert apples don't really make good cider"* (NY_Producer02). Producers also emphasized different approaches to managing fermentation microbiology as an element that they can manipulate and which affects cider sensory quality. Purist producers often aimed to use wild or native yeast for their fermentations: *"I have a very specific process for culturing wild yeast, where I go out into the orchard, about three or four days ahead of whatever we're pressing to the place where we're picking from… get the apples, grind them with the skins on and begin a starting fermentation. And then inoculate the tanks with them"* (NY_Producer01). Experimental producers preferred to use different domesticated yeasts as a way to create more complicated sensory profiles: *"I've spent a lot of time researching and using different yeast… so using like Sauvignon Blanc yeast with certain enzymatic properties that will*

enhance that aroma and add that pineapple-y character to this" (VA_Producer11). Meanwhile, other producers noted their use of only one domesticated microorganism across their whole line of ciders so that they could allow the raw materials of their cider to shine through: *"we haven't gone that direction in wanting the yeast to leave a specific mark. We want the yeast to disappear, to basically do its job and be done."* (VA_Producer16). Other cider production methods that contributed to the cider story included letting pulp macerate for 24 hours before pressing the juice (NY_Producer06), backslopping to continually ferment new batches of cider (NY_Producer04, VT_Producer20), the use of qvevris for fermenting and aging cider underground (VA_Producer12), and the use of applewood that was smoked in the producer's backyard (VA_Producer13). Such diverse production methods likely coincide with varying perspectives on quality and warrant further investigation to understand in detail.

Producers also noted that "good" cider takes time to produce, allowing flavors to develop: *"you've got alcohol you've got esters, you've got other components to the cider that are immature for a time. Eventually they meld, work with each other to create a more interesting profile. So, we seek to… allow ciders to age to the point where they reach a mature profile where they have mouthfeel where there's a definite beginning, middle and finish to the taste of the cider"* (NY_Producer03). Producers discussed how time is a trade-off for manipulations on the path to making a good-tasting cider because the *quick* fermentation and production (e.g., less than one month) of a cider from start to finish will often require added acids, adjuncts, sugar, microbial nutrients, fining agents, and antimicrobial agents (Lea 2008; Proulx and Nichols 1980). In contrast, longer production times and nutrient-rich apples can nearly negate the need for such manipulations. These approaches to different timelines and methods of production are also , subsequently, an extension of cider-makers' philosophies and their desires for a certain

quality of product. Though cider production can require anywhere from a few days to several weeks, and cider can be aged for upwards of multiple years (Lea 2008), both cider production time, aging, and all other aforementioned production elements can serve as guiding posts of cider sensory quality among producers. In the context of Hennion's active and reflective tasting experiences, elements of *terroir* and production help *amateurs* (be them producers or consumers) become attuned to not only the sensations of their mouths, but also the reducible causes of those sensations (Hennion 2007, 101).

Creating Value

Lastly, producers emphasized how the story appeals to consumers and creates connection between the producers, the consumers, and a place: *"what it can provide is a connection to a cidery, where people can come here and learn how we make cider and they can trust that we know what we're doing… and have that connection to the brand, and they can have a connection to a specific orchard if you're an orchard-based cidery"* (VT_Producer17). Appropriately, one producer said *"I like to always have a story behind my cider, like why I did it or whatever. I just feel it kind of sells it better too"* (NY_Producer02), highlighting how production-oriented information also adds value in the eyes of consumers. These observations align with how *terroir* can be socially and economically embedded in communities (Trubek 2008), and how consumer and producer values are reordering to prioritize connectedness, where their food comes from, and how food is made (Labelle 2004; Myles 2020; Paxson 2013). Nonetheless, even cider products that have a great story still need to taste "good," and so producers attempt to remain focused on the sensory qualities that they create in their products: *"If it's a cider that's made in a very natural process with great intention, but tastes like socks, then it's not a good cider, even if you had good intention behind it"* (VA_Producer15).

In addition, extrinsic elements of the cider story seem to suggest that cider is an *unfinished commodity* similar to artisan cheese, where the backstory of how cider is made or where it comes from can frame a product as an intentionally crafted, specialized result of a place and process (Paxson 2013). With unfinished commodities, select elements of the production story are emphasized to showcase how natural environmental conditions and empirical craftsmanship lend to the unique finished quality of an artisan cheese product compared to a product made via "assembly line production" (2013, 14). Cider producers engage in similar behaviors by unveiling the backstory of their products, which in turn generates moral value for themselves and conveys the notion that these things matter for the identity of their commodity. However, cider producers and the elements of the stories which they chose to share are not always easily relatable, understandable, or value-adding – so extension and outreach efforts may be relevant for supporting cider producers to communicate cider production in meaningful ways.

Cider Economics

When asking cider-makers how cider should be valued, cider-makers believed that a cider's value was a culmination of many different factors. In this section, we contextualize perspectives on cider valuation and the agricultural economics of apples by relating our observations of producers to broader socioeconomic theories.

Packaging

With discussing how cider should be valued, ample discussion arose regarding cider packaging. For producers whose goal was to make money and grow, bottling cider was not a viable option: *"Bottles are a dead format if you want to move any sort of volume"* (NY_Producer04). Other producers noted how bottled cider was only sellable in wine-producing

regions where bottled beverages are more commonplace: *"Finger Lakes you only can sell them there because of all the wineries, if they didn't have those wineries there they wouldn't sell their 750 milliliter bottles"* (NY_Producer02). Such ideas are reminiscent of various scholars' discussions about cultural *terroir* and theories of economic embeddedness wherein markets operate within cultural, social constraints (Barham 2003; Lahne and Trubek 2014; Paxson 2013). Comparatively, producers viewed cans as cheaper and more accessible, though not always in a positive way: *"for me personally, it is almost impossible to shake the feeling that what I'm drinking in a can should be lower in alcohol, thirst quenching and fairly inexpensive."* (NY_Producer01). One producer emphasized how canning cider allows it to be viewed and valued similarly to that of beer, minimizing cider's value when it should be worth much more considering how much time, effort, and unpredictability goes into making cider: *"We're a victim of our own history, in that we've sold cider like beer"* (VT_Producer17).

Commodifying Production

Producers unanimously agreed that consumers overall should pay more for cider than they are currently paying because apples *"cost more than water"* (VT_Producer18). Indeed, apples are an unpredictable, biennial crop requiring extensive attention and financial resources to grow year-round (Becot, Bradshaw, and Conner 2016; Futrell 2017; Merwin 2015; Peck and Knickerbocker 2018). This quote suggests that cider is intrinsically more expensive than other comparable alcoholic beverages that use water as a primary ingredient (i.e., beer), and that cider should be made with a level of care and intentionality that does justice to the cost, effort, and resources required to grow apples. The types of apples and the way they are used in cider-making can and should heavily influence how cider is valued.

Though cider should "cost more" in general, cider producers broadly disagreed on exactly how much cider should cost. Most producers believed that cider should cost an amount that depends on how it is made. For example, a cider that takes longer to produce or utilizes rare apples that were grown ethically should cost more. Cider that is made quickly and from concentrate should be relatively inexpensive: *"There are various economies that bear on the price of the cider, if you're using dessert culls from the West Coast, they're going to be dirt cheap… doesn't mean the cider can't be good. But if you take other shortcuts in the fermentation and production processes that compromise what the product could be and just settle for that, then it's not as good and you shouldn't get as much money for it"* (NY_Producer03).

These sentiments are a continuation of how the cider story is value-adding, but they also exemplify the commodification of production ethics and labor (Paxson 2013). As well, they highlight the power that producers have to unveil the politics (and economics) of production to consumers, a facet of Marxist theory (D. Goodman and DuPuis 2002). As producers instill their values and expectations related to agriculture and production into the products they make and consume, the beverage itself becomes defetishized but hard work, sustainability, and other production elements become fetishized in trade. To be a cider-maker is not simply the pursuit of business success nor craftsmanship; it is a moral livelihood to use apples in a way that maintains, increases, and communicates their value rather than reducing it. Cider producers want cider's value to be based on *all* of the systems and identities that go into it rather than its utility value alone: *"For me… it's coming out of the land that I'm at, and it tells a story of where I am and who I am"* (NY_Producer07). Commodifying production elements has been discussed as a potential detriment in other food systems, such as those related to animal welfare as in the case of "free-range" eggs (M. Carolan 2021, 122). However, the long-term implications of production

commodification are not well understood, particularly in a young and growing industry such as the US cider industry which currently struggles to articulate definitions of quality in the context of production.

Sensory and Economic Tensions

Cider producers also toil with their personal desires for sensory quality and their goals for commercial success. Most cider producers preferred the complexity and nuance of traditional style cider though some producers, particularly experimentalist producers, explicitly choose not to make traditional cider because it does not *"pay the bills"* (VA_Producer12). Traditional ciders were thought to have limited market potential because consumers were perceived to not appreciate the sensory qualities imparted by cider-specific apples. This suggests that some cider producers, many being experimentalists, make products that they do not personally prefer in an attempt to satisfy consumers and maximize their business profits: *"I personally love… British ciders especially because there's so much different from what we make they're flabby… they're leathery, they're band aid, they're f***** up but I love them because they're so interesting. But I don't think the American consumer is ready for that"* (NY_Producer04).

At the same time, however, not all cider-makers were reliant on their cidery business for their full income: so, the decision to make the personally preferred, traditional style cider can depend on how much profit a producer seeks to maximize. Cider producers whose livelihoods are supported by something other than cider can have cidery businesses that do not make much profit (Paxson, 2013), so they may be less inclined to cater to the preferences of consumers in the marketplace: *"our livelihood isn't tied to me… unlike a lot of my peers, I'm not trying to scratch out a living doing this"* (VT_Producer18). As with artisan cheese, most small and medium size cider producers are not getting rich off of the labors of cider-making; rather, "they are getting by

– or relying on wealth generated through other means" (Paxson, 2013, 83) because of the economic confines of apple agriculture. Producers who seek to make a satisfactory profit by sticking to their personal preference and moral values are like "satisficers" in the context of behavioral decision-making, while producers who seek to maximize their profits by catering to the expected desires of others will often abandon their own preferences and values in the process, termed "maximizers" (Parker, de Bruin, and Fischhoff 2007). Producers looking to make a profitable cidery business and struggling to balance what they personally want to drink, make, and sell resemble Stephen Gudeman's description of economic tension wherein there are two ways of "making material life – for the self and for others" (Gudeman 2008, 14).

Economies of Scale

Lastly, cider-makers engaged in discussion related to scale of cider production and locality. Many cider producers indicated a desire to not get *"too big"* (NY_Producer06) and keep things small: *"We get approached by distributors, we've turned them all down. We just don't want to be that company. We're not interested in making… a million gallons of cider"* (NY_Producer02). Apples were heavily influential on the scale at which a cider-maker could produce cider because cider-specific apples are rare and limited in supply (Miles et al. 2020; Ostrom et al. 2022). Therefore, producers emphasized that those seeking to maximize their volume and profits could not use cider-specific apples for large scale cider production – indicating that natural elements of the cider supply chain have strong implications for cider producers.

Preferences for local fruit continue the theme of scale: only so many apples can be grown in a certain area. Further, there is no concrete definition of "local" cider – is "local" defined by where the apples are from, where the cider is made, where the cider is sold, or all of these things?

For some producers, local meant that cider fruit had to come from the US at the least, but preferably from the region or state: *"we've been sourcing our apples, almost exclusively from southwest Virginia, sometimes as local as a tree about a block from here, a few trees about a block from here sometimes"* (VA_Producer13). Farris et al. (2019) has ascribed "localness" to the state in which a cidery is located, though this avoids the geographical origins of the apples used in a cider. Nonetheless, producers varied in their preferences for sourcing "local" ingredients. For producers focused on efficiency and profits, local was not a priority: *"For it to come from local sources or not doesn't really matter to me too much"* (NY_Producer04). For producers who aim to source local products and produce smaller volumes of cider, the goal is less about making money and more about constructing a product that conveys the values of an artisan and creates connectedness with consumers: *"most cidermakers are going to be small and niche, and they're going to have an opportunity to connect with their consumers"* (VT_Producer17). These economies of scale and sentiment are again comparable to those described in artisan cheesemaking (Paxson 2013), where artisan cheese production is motivated by craftsmanship, environmental sustainability, animal welfare, family tradition, community culture, and a host of other forces. At the same time, the economies of scale in the cider industry reveal that the "maximizing approach" to cider-making may be accompanied by a diminished intimacy with both agriculture and community.

The Drinking Occasion

In discussing cider, some producers made note of how their preferences change depending on the drinking occasion. Many cider-makers drew connections between the drinking occasion and their sensory preferences: *"I like to think there's a different cider for every occasion… If I'm out on my kayaks maybe light American style cider will be the thing to do. If*

I'm having a cold winter dinner with pork roast, I'll try something a little bit more tannic" (NY_Producer10). Producers expressed how light, refreshing cider better suits casual drinking occasions, whereas complex cider better suits reflective, meal-oriented drinking occasions. Further, the refreshing cider of casual occasions is also often packaged in a can, making such a product more approachable and accessible for commonplace consumption occasions. The complex, tannic cider that is better suited for reflective, intimate, meal-oriented occasions is often packaged in bottles – exemplifying how cider sensory quality, cider packaging, and the drinking occasion are three factors which seem to define the cider-drinking occasion according to cider-makers. These sentiments closely parallel those of cider consumers in the Northeast and Mid-Atlantic (Calvert et al. in review) and research of Virginia cider consumers who ascribed different styles of packaging to different drinking occasions (Kessinger et al. 2020).

Producers also emphasized how the occasion relates to the desire for the cider story. Though there is value in a story, and many producers do enjoy learning something about how a cider is made or where it comes from, this information is only welcome at certain times and places. Producers understood this both as consumers themselves and in the eyes of their consumers: *"The main goal here is to connect people with not just cider but with the land itself, where cider comes from. And sometimes that's not what they're looking for… if people are coming to hang out and hear music and have dinner. We don't need to talk about it"* (NY_Producer08). Though product information can foster connectedness and be valued-adding, excessive information given at inopportune times can give an impression of pretension and can forge cultural divisions amongst consumers (Bourdieu 1984; Labelle 2004). Thus, a cider marketplace that has different products and different ways of disseminating product information

to suit different drinking occasions is powerful in giving consumers and producers agency over their food choices and their connectedness with the broader food ecosystem.

Limitations

The present study aims to holistically explore cider producers' preferences for cider and the cider-drinking experience, through a lens of both production and consumption, in a representative sample of American cider producers in the Northeast and Mid-Atlantic US. However, this research has important limitations. The present sample of cider producers may not accurately represent the perspectives of all cider producers across the Northeast and Mid-Atlantic US. This research design is underpinned by a critical realist ontology and contextualist epistemology which assert that all of the viewpoints shared in this study are real, true, and valid for the specific participants involved in the study (Braun and Clarke 2013; Tebes 2005). Cider producers have many values, preferences, or beliefs that may or may not align with those conveyed in the present study, and these findings may or may not be generalizable to other cider-makers in the broader US cider industry. In practice, future research may seek to expand this exploratory research to other areas of the world or other growing categories of the alcoholic beverage sector.

As well, the researchers acknowledge their fundamental role in conducting, framing, and analyzing the phenomenological results presented here. The first author (MDC) was the lead researcher on this project, serving as the moderator for all interview sessions and the primary coder during reflexive thematic analysis. Both the first and last author are trained sensory scientists, with other authors representing backgrounds in economics, enology, and agroecology.

Conclusion

American cider is an increasingly popular beverage led by regional cider producers and small- and medium-size apple growers who contribute to local and rural economies. Though cider quality research has expanded to appropriately support the growing industry, a holistic account of how cider producers view and value the products that they make has not been described in research. Through the use of qualitative interviews with professional cider-makers, this research explores perceptions of cider quality and the cider-drinking experience among producers from three leading cider-producing states in the Northeast and Mid-Atlantic US. Results of this research highlight diverse philosophical approaches to cider-making and drinking that are heavily influenced by agricultural values, business motivations, and personal craftsmanship and creativity. Cider producers' perceptions of overall quality in cider were heavily informed by sensory quality, with most producers preferring balanced flavors and mouthfeels. As well, many producers pay close attention to how cider production processes carry through into the final sensory quality of the product. For some producers, experiencing and showcasing *terroir* in the products they taste and make is fundamental to the cider experience, while other producers are motivated to use apple juice as a vessel for experimentation. As well, the consumption occasion guides many producers' beliefs and values related to cider quality, which suggests that the cider industry can be host to a diverse marketplace with products that appeal to a variety of drinking occasions. In this research, producers also offer diverse perspectives on the history of American cider and the current lack of resources for underrepresented groups in domestic agriculture, and how these two issues should be discussed and recognized within the broader alcoholic beverage industry. However, observations dealing with the latter deserve a more thorough investigation than could be adequately conducted herein.

Nonetheless, this report offers new insights that showcase how producers value cider as uniquely knowledgeable and influential consumers themselves.

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Data Availability

Anonymized data are available from the corresponding author upon reasonable request.

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