

## Consumer drivers of muscadine wine purchase decisions

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### **Abstract:**

Muscadine wine, fresh muscadine grapes, and other derivatives have enjoyed a heritage niche for decades in the Southeast. Muscadine growers in North Carolina in the United States (US) have asked whether the purchase of muscadine wine is linked to consumption of the fruit itself or even familiarity with other muscadine-based products in terms of spillover effects. The authors explored the interdependency between the market for fresh muscadine grapes and muscadine wine purchase. Consumer panel data were obtained from a State of North Carolina agency with oversight of the grape and wine industry; the agency contracted quota sampling of online consumers from six states in the US South. A total of 543 cases were used in the present study. The Statistical Package for the Social Sciences (SPSS)<sup>®</sup> was employed in analysis. Results show that prior muscadine wine knowledge and knowledge of other muscadine products, e.g., jams, juices, smoothies, sauces, and health/beauty products were significant factors associated with buying muscadine wine. Beliefs about muscadine grapes as a healthy ingredient showed a slight influence, while direct experience with fresh muscadines and consumer attitudes towards buying local or US products were insignificant. Therefore, marketing efforts should focus on increasing consumer exposure to and knowledge of muscadine wine and other muscadine related products.

**Keywords:** cognitive | consumer | health | ingredient | knowledge | muscadine | patriotism | product category | wine

### **Article:**

**\*\*\*Note: Full text of article below**

Article

# Consumer Drivers of Muscadine Wine Purchase Decisions

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**Abstract:** Muscadine wine, fresh muscadine grapes, and other derivatives have enjoyed a heritage niche for decades in the Southeast. Muscadine growers in North Carolina in the United States (US) have asked whether the purchase of muscadine wine is linked to consumption of the fruit itself or even familiarity with other muscadine-based products in terms of spillover effects. The authors explored the interdependency between the market for fresh muscadine grapes and muscadine wine purchase. Consumer panel data were obtained from a State of North Carolina agency with oversight of the grape and wine industry; the agency contracted quota sampling of online consumers from six states in the US South. A total of 543 cases were used in the present study. The Statistical Package for the Social Sciences (SPSS)<sup>®</sup> was employed in analysis. Results show that prior muscadine wine knowledge and knowledge of other muscadine products, e.g., jams, juices, smoothies, sauces, and health/beauty products were significant factors associated with buying muscadine wine. Beliefs about muscadine grapes as a healthy ingredient showed a slight influence, while direct experience with fresh muscadines and consumer attitudes towards buying local or US products were insignificant. Therefore, marketing efforts should focus on increasing consumer exposure to and knowledge of muscadine wine and other muscadine related products.

**Keywords:** cognitive; consumer; health; ingredient; knowledge; muscadine; patriotism; product category; wine

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## 1. Introduction

Home to approximately 2300 grape-bearing acres (approximately 1000 acres of muscadine) and more than 500 grape growers, North Carolina (NC) is the 11th largest grape-producing state in the country [1]. Following the eradication of tobacco-price supports in 2004, tobacco production more than halved to 325,000 acres, and revenues dropped to \$1.1 billion by 2011 [2]. North Carolina has been at the forefront of seeking alternative agricultural strategies such as grape growing. According to the NC Winegrowers Association, grapes are one of the few crops in the state that can replace tobacco dollar for dollar [3]. An important grape for NC growers is the muscadine; the muscadine is native to the state [4]. Muscadine growers sell the grape both as fresh fruit for consumption and as an ingredient in a variety of products [5,6].

However, grape farming is a long-term process, and the grape and wine industry further differs from the tobacco industry in that it depends greatly upon marketing efforts, particularly for farms opting to produce wine and other derivative products for local distribution. Researchers have highlighted the need for systematic consumer profiling [5,6]. Areas that were emphasized included consumer perceptions of muscadines and current consumption patterns. In addition, prior studies have suggested that marketing endeavors needed to be based on a fuller understanding of muscadines

as a diverse heritage grape and other consumer attitudes towards muscadine product characteristics and benefits, such as localness and healthiness [5,6].

Like many derivative products, muscadine wine has the potential to be affected by consumer opinion and behavior towards its central ingredient, the muscadine grape. To support the industry in its marketing planning, the current study looked at the interplay between consumer experience with the grape itself and the decision to buy muscadine wine. The research was based on extensive secondary data supplied by the state of North Carolina and was exploratory in nature. The paper had four main objectives: To document consumer perceptions of muscadine grapes; to identify the role and potentialities of branding muscadine wine based on the central muscadine grape ingredient; to identify significant drivers of consumer behavior in relation to muscadine wine purchase; and to offer preliminary prescriptive marketing suggestions for NC muscadine wine suppliers. To support these goals, the present analysis set forth and assessed expected positive associations between knowledge about fresh muscadine table grapes, knowledge about muscadine derivative products (including wine) and muscadine wine buying, as well as other exploratory factors that influence wine purchase.

### *1.1. Consumer Product Experience with Muscadine Wine*

Product knowledge and experience have exercised important roles in consumers' purchase decision making [7,8]. Product experience in the food and beverage realm has encompassed cognitive, emotional, physical, sensorial, and social exposures to products. Eating food products has generated long-term associations, which comprised a variety of aspects: Visual and olfactory traces, texture, food taste perceptions, and beliefs related to consumption and other issues, such as remembered occasion or contextualized benefits [9,10].

Studies have depicted multiple sources of prior experience with wine, i.e., information searches, virtual and direct educational activities, and direct product consumption. In one study, information seeking was a critical consumer strategy used across seven different wine consumption occasions [11]. Another tactic, wine education, has created a sense of familiarity and reduced negative attitudes among consumers [12]. Social media technologies have greatly facilitated the creation of many types of virtual wine experiences, e.g., user-generated information, expert-based product ratings, video tutorials, and sourcing data have been deployed on websites to generate recommendations and influence consumer preferences [13,14]. Lastly, direct product experience presented as a mix of usage behaviors such as wine tasting during winery visits or wine service in restaurants.

Variables such as subjective wine knowledge have influenced subsequent consumer motives and actions [15]. Where there have been previous satisfactory consumption experiences, familiar products were more likely to enter the consideration set for future purchases, particularly for food staples. Cognitive dissonance theorists [16] explained that familiar products may be preferred based on the desire to be consistent with past behaviors. High familiarity consumers have shown higher involvement with studied food products and a greater tendency to associate symbolic values with product consumption [17].

Product knowledge was one key in explaining agricultural/food consumer behavior such as wine purchase. Gustafson, Lybbert, and Sumner [18] asserted that knowledge and preference are separable, and that knowledge facilitated the conversion of product information to consumer expectations for product quality. Prior users generally had more positive attitudes towards a product than nonusers. Consumers with higher subjective wine knowledge showed more self-reliance when making purchase choices and relied on more extrinsic wine attributes in wine evaluations, such as appellations/labels and expert ratings [19]. Consumer product knowledge has correlated to sales of wine products and responsiveness to marketing strategies. For example, consumers' prior wine knowledge has been seen to be positively associate with consumers' hedonic ratings and purchase of red wines in particular [20]. Additionally, wine consumers who thought they knew a lot about wine tended to engage in more variety seeking behavior in their wine purchasing, and increasing consumers' knowledge has improved the successes of product differentiation strategies [21].

Based on the projected relationships between product knowledge formation and subsequent consumer behavior, people with prior muscadine wine knowledge are expected to have more positive attitudes towards muscadine wine purchase. This is certainly not a surprising expectation; the first hypothesis frames the expected relationship between muscadine wine knowledge and muscadine wine purchase:

**Hypothesis 1 (H1).** *Consumer subjective knowledge about muscadine wine is positively associated with buying muscadine wine.*

### 1.2. Ingredient and Similar Product Spillover

Spillover effects on wine purchase were anticipated due to experience with a product's featured ingredients and familiarity with other products using those same ingredients [22]. Spillover occurs because consumers make mental associations among related products under a broader cognitive schema. For example, seeing the term 'muscadine' might make the consumers focus on a broader notion of muscadine infused products rather than on muscadine wine in its narrower context. In turn, memory of previously (dis)liking an ingredient or sister product within the greater muscadine product category is expected to influence attitudes and purchase intentions towards the wine.

#### 1.2.1. Salient Ingredient Influences

Consumers have expressed an ongoing interest in food and beverage ingredients for a variety of reasons. Consumers were seen to actively search for ingredient labels and categorizing products by the ingredients they contain in order to make important determinations, such as avoiding components that trigger allergies or acquiring products with ingredients known to promote health benefits [23,24]. Therefore, ingredients were a salient concept in the minds of consumers when buying foods and beverages, if only for past associations with something pleasant or unpleasant.

The present thinking parallels that of ingredient branding where a host product was marketed using information about ingredient brands, an approach that assumed consumers could cognitively switch between broad product categories and those subcategories that lie beneath. In ingredient branding, producers inferred product quality and value through the product ingredients they featured in their marketing [25,26]. Research results suggested that, when there was a high degree of perceived fit or synergy between the host (final product) and salient ingredients, ingredient marketing increased the purchase probability of both [27].

Notably, there are consumer perceptions of the muscadine grape that differentiate it from other table and wine grapes. Dominant attributes of the muscadine grape have included: Edible as fresh fruit, substantial sweetness, juiciness, and uniqueness, with some negative concerns regarding thickness of the skin and large seeds that normally are not consumed when eating the fresh muscadine [28]. Muscadine wine has been called a sweet beverage, and winemakers have added additional sugar during production stages, thus carrying forward the reputation of the grape as very sugary [28]. Muscadine grapes (*Vitis rotundifolia*) are seen as a single variety (although there are multiple cultivars on the market), unlike the distinctions consumers have made among varieties of table grapes and vinifera wine grapes. By extension, muscadine wine is viewed by most consumers as a single type of wine, which makes a direct cognitive association between the muscadine grape ingredient and muscadine wine easier to justify, as follows:

**Hypothesis 2 (H2).** *Consumer subjective knowledge about fresh muscadine grapes is positively associated with buying muscadine wine.*

### 1.2.2. Connected Product Influences

It is vital to acknowledge the importance of ‘connected’ products in marketing food and beverages. Products can be connected in multiple ways, e.g., as different products under the same brand, or as in this study, by a sharing of primary flavor/fruit ingredients. It is postulated that consumers must expect to experience a similarity between two related subcategories of food on some definable and desirable attributes. Such parallels in the muscadine case could be product-defined, e.g., sweetness or benefit-defined, e.g., health promotion [5,6,29]. This study looked at consumer experience with and perceptions about other muscadine products, and subsequently explored the relationship of those perceptions to purchase histories on buying muscadine wine, with expected findings noted in the following hypotheses:

**Hypothesis 3 (H3).** *Consumer subjective knowledge about other derivative muscadine products, e.g., jams, juices, smoothies, sauces, and health/beauty products, is positively associated with buying muscadine wine.*

### 1.3. Values Influencing Muscadine Wine Purchase

Wine consumption and purchase decisions are complex matters, with numerous extrinsic and intrinsic factors that affect the consumer decision process. Consumers have reportedly considered social aspects, e.g., prestige and occasion when selecting a wine for purchase. Moreover, means-end chain theory encouraged researchers to observe and understand how wine products could be used to meet the personal values of consumers, and why they might have selected a specific wine option to conform to those values [30]. Many consumers believe that brands do not overtly reflect the values of their consumer base—marking a promotional opportunity for brands that do. Two consumer values (concern for personal health and buying local) were especially significant for the muscadine wine market, due to unique features of the grape.

#### 1.3.1. Concern for Personal Health

In two consecutive consumer panel studies in Australia (2012 and 2014), the effects of food on people’s health and the safe preparation of food were viewed as the most important knowledge and skills for average consumers to possess [31]. During the period from 2002 to 2011, over 1200 papers were published on medical research about the effects of wine consumption on humans [32]. The health benefits of wines were mainly due to antioxidant activities of the phenolic compounds associated with positive traits such cardioprotective, anti-carcinogenic, anti-atherogenic, anti-inflammatory, antiviral, and antibacterial properties [32,33]. General interest towards nutritional labeling of wine has increased as well, particularly for middle-aged women with higher levels of education based on US data. [34]. In a study comparing Korean and Australian wine consumers, Korean consumers were more sensitive to health benefit claims of wine, although both groups were moderate in the degree they believed wine would reduce the risk of certain diseases [35].

Given that muscadine grapes are extremely high in total phenolic content and potentially can be marketed on the basis of such information [36], the present analysis additionally examined whether or not health benefits were important in muscadine wine purchase. Two hypotheses were posited.

**Hypothesis 4 (H4).** *Consumer attention to monitoring personal health is positively associated with buying muscadine wine.*

**Hypothesis 5 (H5).** *Strength of consumer beliefs about the positive health benefits of muscadine grapes is positively associated with buying muscadine wine.*

#### 1.3.2. ‘Buy Local’ and Patriotic Purchasing

Consumers have faced external and internal pressures to buy local. External forces included social movements such as ‘Farm to Fork’ [37] that have tried to make point of origin and supply chain details

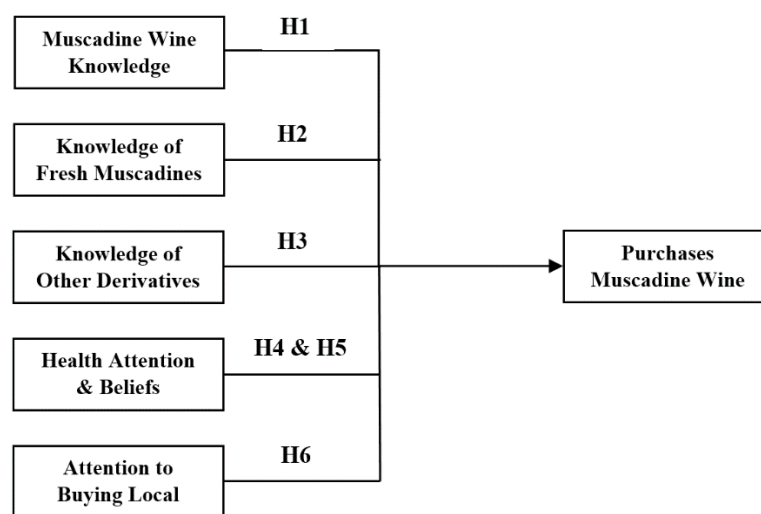
more transparent; their goal has been to teach consumers to consider the point of origin information about input materials and food processing prior to purchase. Likewise, more and more governments have urged resident wine consumers to buy local to support their regional wine producers and other farmers in the area. Consumers have used point of origin labeling cues to infer food safety, food quality, and as a way to support local producers [38].

Consumers have preferred foods that were symbolically associated with their own culture, in order to reinforce their sense of belonging [39], demonstrating the power of psychological factors in motivating food behavior. Internal forces included influences such as consumers' patriotic values leading them to purchase local rather than imported foods [40]. Ethnocentric-minded customers have spent additional efforts to look for "Made in USA" or "Made in America" labels in clothing and actively sought out local sourcing information on food [41]. In addition, sales of local goods have been connected theoretically to patriotic-motivated consumer attitudes; for example, Czech consumers bought local yogurt more often [42] and Chinese consumers were shown to prefer domestically grown fruit [43].

However, study results were affected by the kind of product investigated in that the effects of consumer ethnocentrism have varied across product categories, and more specifically, food types [44]. Specifically, this study incorporated an analysis of items related to patriotic spending and preferences for US/NC products to see what influence these value statements have on muscadine wine purchase.

**Hypothesis 6 (H6).** *Consumer preference for buying US and NC products is positively associated with buying muscadine wine.*

A pictorial overview of the research is presented in Figure 1.



**Figure 1.** Outline of research constructs in the muscadine wine study.

## 2. Materials and Methods

A convenience sample of consumer panel data was generated through a third-party online survey service (Qualtrics™ of Provo, UT, United States) by the State of North Carolina and provided to the authors. Qualtrics™ software was used to create the survey. This software had capabilities of logic flow, answer piping, and question types that allowed for complex analysis. The survey software checked each response record for selected indicators of bad data quality, such as speeding through questions, straightlining scale items, and gibberish answers to open-ended questions.

Once programmed, the survey was tested by invited members of the wine industry not directly connected to the project, then soft launched via Qualtrics™ to get a controlled look at preliminary results and to ensure that the survey was functioning as designed. Qualtrics™ distributed the survey

to a field of respondents contacted through an undisclosed panel partner. Links to the survey were distributed to members of the panel, and once they voluntarily entered the survey, they were assigned an identification number to distinguish their unique record in the data set. Demographic data including age, gender, ethnicity, household income, education, and area type (suburban, urban, rural) were collected in the survey. The survey was made available over a nine-day period from 13 to 21 June 2017. Average response time spent on survey was 16.8 min per Qualtrics™ system reports.

### 2.1. Sampling Design and Screening Process

Respondents were targeted based on their having made purchases of table grapes in the last year since the focus of the original research was the competitive positioning of NC fresh muscadine grapes. Respondents were also required to be over 21 due to references to alcohol/wine purchase, since the legal age for alcohol consumption in North Carolina is 21 years. This yielded 789 willing respondents.

Potential respondents were further screened for state residency based on the local nature of muscadine grape consumption as per the survey client's (NC wine and grape industry) requirements. The survey accepted consumer panelists who resided in one of six US Southern states representing major markets for NC muscadine products. Quotas were used to oversample NC consumers at 40% of total sample, with other states (Georgia, Florida, South Carolina, Virginia, and Tennessee) each averaging 12% of the sample. After filling state quotas (determined by project budget) and refining for missing data, a total of 543 usable cases were achieved.

### 2.2. Data Collection Instrument

The survey instrument collected data about consumer attitudes and behavior toward muscadine grapes and derivative products, including wine. Multiple survey items were included, covering topics such as muscadine grape purchase and usage, subjective product knowledge of muscadine products [6,15], and consumer attitudes and product beliefs related to health benefits (i.e., Gould's Health Consciousness Scale [45]) and buying US/NC products (i.e., Shimp and Sharma's CETSCALE on consumer ethnocentrism [46]). Table 1 provides an overview of the survey item statements related to major constructs studied. The outcome variable was collected via a dichotomous question phrased as "Have you ever bought muscadine wine?" with optional answers of 'yes' or 'no'. All product knowledge variables were elicited by asking respondents to use a familiarity scale of 1 to 3 anchored by labels "Not at all", "Moderately", and "Extremely".

**Table 1.** Subjective product knowledge items.

(expert = 3; intermediate = 2; novice = 1)	Mean	Standard Deviation	Number of Items	Cronbach's Alpha
<i>Knowledge of Muscadine Wine</i> Muscadine wine/alcoholic beverages	1.83	0.77	1	–
<i>Knowledge of Fresh Muscadine</i> Muscadine fresh grapes	2.21	0.79	1	–
<i>Knowledge of Other Muscadine Products</i> Juices or juice blends Slushies or smoothies Jams, jellies, preserves Sauces/condiments Nutraceuticals Nutritional supplements Cosmetic/beauty products	1.54	0.55	7	0.865

### 2.3. Data Analysis

Data was acquired in the form of an electronically exported and transmitted CSV spreadsheet, and subsequently saved as both Microsoft Excel® and Statistical Package for the Social Sciences®

(SPSS®) files. SPSS® analysis was employed in subsequent steps. The first step was to characterize the respondent profile by running descriptive analyses of available demographics, muscadine product buyer and user behaviors, and marketing scale items related to consumer knowledge and buyer motive items. Next, the authors investigated potential associations between demographics and buying muscadine wine. Then, reliability analysis was conducted for each of the marketing scale item sets (see Tables 1 and 2). Finding adequate coefficient alphas (see Tables 1 and 2), researchers calculated average scores for each marketing scale. Lastly, forward logistic regression was conducted to assess potential relationships between selected factors and the dichotomous variable of buying (or not) muscadine wine.

**Table 2.** Supplemental marketing scales.

(strongly agree = 5 to strongly disagree = 1)	Mean	Standard Deviation	Number of Items	Cronbach's Alpha
<i>Attention to Personal Health</i>	3.52	0.91	11	0.942
I reflect about my health a lot				
I am very self-consciousness about my health				
I am attentive to my inner feelings about my health				
I am constantly examining my health				
I am alert to changes in my health				
I am usually aware of my health				
I am aware of the state of my health through the day				
I notice how I feel physically as I go through the day				
I am very involved with my health				
I check the package information carefully on food I buy				
I read the nutritional labels on the food that I buy				
<i>Perceived Muscadine Health Benefits/Risks</i>	3.91	0.71	5	0.848
Muscadine grapes offer proven health benefits				
Muscadine grapes offer proven nutritional benefits				
Muscadine grapes are not genetically modified				
Muscadine grapes are pesticide-free				
Muscadine grapes are organically grown				
<i>Attention to Buying US or Local</i>	3.66	0.89	6	0.910
I buy American products first, last and foremost				
Americans should always buy American-grown or manufactured products				
Buying imported products hurts American business and causes unemployment				
It may cost more, but I prefer to support American businesses and products				
It is not right to buy imported goods if similar products are made in the US				
We should only buy imported products that we cannot obtain within our own country				

### 3. Results

North Carolina residents constituted 40 percent of respondents with other Southern states averaging 12 percent. The sample was predominantly female (77%) and evenly divided across age groups (median percentage is 19% per group) except for ages 21 to 24, which was only 6%. Respondents reported earning household incomes from 20,000 to 59,999 US dollars.

Knowledge scores were highest for muscadine juice and lowest for cosmetic/beauty products and nutraceuticals (see Table 3). Over fifty-percent of the samples also had intermediate or expert subjective knowledge of muscadine jams, wines, and fresh muscadines. The top purchases of muscadine products were jams, wines, juices, and fresh grapes in descending order. Muscadine wine purchase levels were similar to previous studies [6]. Specifically, 42.5% bought muscadine wine (see Table 3). Further demographic analysis showed that only age associated significantly with muscadine wine purchase. Older respondents (65 and over) bought muscadine wine proportionally less frequently (25% bought) than do all younger age groups (47% on average). Table 4 depicts buyers' uses of



purchased muscadine grapes. The primary purpose of buying the grapes was to eat them as a fresh fruit by themselves.

**Table 3.** Knowledge and purchase of products made with muscadine grapes \*.

Product Type	Novice Knowledge	Intermediate Knowledge	Expert Knowledge	Percent Have Purchased
Jams, jellies, preserves	34.2%	34.6%	31.2%	50.3%
Wine/alcoholic beverages	38.6%	37.2%	24.2%	42.5%
Juices or juice blends	24.1%	34.8%	43.1%	42.5%
Fresh muscadine grapes	38.5%	31.3%	30.2%	40.0%
Sauces/condiments	61.2%	24.0%	14.7%	28.0%
Slushies or smoothies	65.6%	21.4%	13.0%	23.6%
Nutritional supplements	67.5%	21.6%	11.0%	21.2%
Cosmetic/beauty products	73.5%	15.3%	11.2%	20.2%
Nutraceuticals	84.5%	10.8%	4.7%	7.2%

**Table 4.** Buyers' uses of fresh muscadine grapes.

Use	Number of Buyers	Percent
Eat them alone as a fruit	205	94.47%
Make preserves, jam, or jellies	44	20.28%
Use them in recipes, e.g., salads or baked goods	36	16.59%
Make juice or other beverage, e.g., wine	13	5.99%
Other	2	0.92%

Furthermore, supplemental marketing scales showed that respondents' attention to personal health was above average with a mean rating of 3.53 out of 5. Perceived positive health benefits of muscadine grapes was 3.91 out of five and respondent attention to buying US or local products was 3.66 out of five (refer to Table 2).

In the subsequent analysis, six factors (see Figure 1) were used in trying to understand people's muscadine wine purchase behavior. A logistic regression was conducted to ascertain the effects of these factors on the likelihood that respondents buy muscadine wine. Regression results (Table 5) show the overall model of four factors (knowledge of muscadine wine, knowledge of other muscadine products, attention to health, and beliefs about healthiness of muscadines) was statistically significant: Chi-Square (3) = 275.750,  $p < 0.0001$ . The model explained 54.6% (Nagelkerke's  $R^2$ ) of the variance in buying muscadine wine and correctly classified 80.0% of the cases.

**Table 5.** Regression coefficients for buying muscadine wine.

Regression factors	Beta Coefficient	Standard Error of Coefficient	Wald Chi-Square Value	df	2-Tailed $p$ -Value	Odds Ratio Likelihood Exp(B)
Knowledge of muscadine wine	2.003	0.208	92.934	1	0.000	7.414
Knowledge of other muscadine products	1.223	0.260	22.196	1	0.000	3.398
Attention to personal health	-0.426	0.149	8.212	1	0.004	0.653
Perceived muscadine health benefits/risks	0.437	0.180	5.903	1	0.015	1.548
Constant	-6.259	0.823	57.797	1	0.000	0.002

Interpretation of Table 5 provided insight into the six hypotheses related to consumer variables that might predict muscadine wine purchase decisions. Both significance of  $p$ -values and likelihoods were considered. An Exp(B) value greater than one and significant at  $p$  less than 0.05 indicates a positive effect on the likelihood of buying muscadine wine. An Exp(B) lower than one and significant shows a negative effect on likelihood of buying muscadine wine. Results indicate that Hypothesis 1 was supported; increasing muscadine wine knowledge was associated with a greater likelihood of buying muscadine wine. Hypothesis 2 was not supported; no association was found between

knowledge of fresh muscadines and muscadine wine purchase. Hypothesis 3 was supported in that increasing knowledge of other muscadine products was associated with greater likelihood of buying muscadine wine.

Hypothesis 4 suggests a positive effect of attention to personal health was not supported, although a significant relationship was found; as a person's attention to personal health increased, the chance of buying muscadine wine would decrease. Hypothesis 5 was supported since increasing perceptions of muscadine grape health benefits was associated with an increase in the likelihood of buying muscadine wine. Finally, Hypothesis 6 was not supported since respondents' attention to buying U.S. or NC products had no significant relationship with muscadine wine purchase.

#### 4. Discussion, Limitations and Future Research

At this point the goal is to interpret findings in light of limitations, previous studies, and the working hypotheses. No research is without its limitations as there were trade-offs of time and money in the data collection. The use of consumer online panelists inherently involved self-selection bias, by including only people who had at least some Internet access; however, there was no indication in the literature that having Internet access either invited or deterred a person from buying muscadine grapes. Additionally, the researchers did not know what was provided as incentives to survey participants since Qualtrics™ agents procured the panelists.

The data used in this study was collected for the underlying goal of positioning NC fresh muscadine grapes in the marketplace. Thus, the authors had no ability to document supplemental wine attitudes and drinking behaviors other than those provided in the existing dataset. Despite the constrained direction of the data foci, findings supported increased understanding of motives in purchasing muscadine wine. The study was also limited to participants residing in a select list of Southern U.S. states, which limited the generalizability of findings. Nonetheless, results were meaningful to stakeholders who willingly focused their commercial activity in this region.

Additionally, muscadine grapes were an unfamiliar product in terms of direct experience, given that only 40 percent of respondents have bought the fruit and 43 percent have bought muscadine wine. When judging an unfamiliar product, respondents may have formed evaluations without objectively useful information. Other methods such as experimental scenarios and intercept trials might have provided other insights into purchasing muscadine wine. Still, several factors were found to be important in predicting if a consumer in this sample buys muscadine wine.

##### 4.1. *The Influence of Product Knowledge on Buying Muscadine Wine*

Three hypotheses were examined related to the effects of different types of product knowledge on muscadine wine purchase: (H1) Prior subjective knowledge of muscadine wine itself, (H2) knowledge about the muscadine fruit, and (H3) knowledge of other muscadine products. Results supported H1; increasing knowledge about muscadine wine impacted muscadine wine purchase. This direct knowledge/purchase relationship performed in line with the theory on the alleviation of consumer risk; Brucks explains that knowledgeable consumers perceive less risk when purchasing food and beverages [7]. Marketing efforts that educate consumers with relevant product knowledge and expand their confidence may be effective strategies to reduce consumer risk perceptions and increase their purchase intentions.

However, findings did not support H2 since prior knowledge of muscadine grapes (the main ingredient in the wine) did not influence wine purchase. It was not clear that consumers were making any real connection between the fruit and the wine purchase. This is not necessarily a bad thing since some aspects of the fresh muscadine grape have caused issues for consumers, namely having large seeds and thick skin, and thus, being difficult to eat compared to other types of table grapes. Our findings suggested that drawing attention to the physical fruit during educational events or via displays in tasting rooms should not have a negative effect on wine purchase.

Down the road, more work could be done to better grasp how ingredient branding influences wine purchase behavior. The ingredient branding literature shows that companies are taking ingredients and creating positive associations for a host product [25]. At the same time, branding of agricultural commodities, i.e., Ocean Spray cranberries and Chiquita bananas, is becoming increasingly important for all types of produce including grapes [47,48]. Therefore, strategically branding muscadine grapes and, subsequently, featuring these branded muscadines in muscadine wines might influence consumers in positive ways that general knowledge about the grape does not.

Hypothesis 3 was clearly supported since increasing knowledge of other muscadine products has a positive impact on the likelihood of buying the wine. Given that consumers were more knowledgeable about juices and jams than other derivative products, i.e., nutraceuticals, and it is important to consider how this knowledge transfers to their perceptions of muscadine wine. Since jams and juices generally are considered high-sugar products unless modified through food science, e.g., Reference [49], this signified that sweetness was a considerably important perception associated with muscadine products. In addition, the top three words/adjectives elicited by an open-ended question asking respondents to describe muscadine fruit they have bought were, in order: Seeds, sweet, and large. These results indicated that people who bought fresh muscadines retained memories of sweetness.

Thus, quite possibly, knowledge of other muscadine products had a spillover effect on expected sweetness of the wine. It is likely that a liking for sweet beverages and food products and a belief that sweetness is a dominant attribute of muscadine food products drives muscadine wine purchase in this study [50]. Future research can tease out more minute differences between attitudes towards the individual types of derivative products, i.e., sugary food items versus muscadine-based health products, and test discrete associations with muscadine wine.

In addition, from a theoretical standpoint, spillover effects need not necessarily be positive for all ingredient-connected subcategory products. For example, many people who eat coffee ice cream or other coffee-flavored desserts will disdain the bitter drink itself. If a regular coffee beverage is tried as the second subcategory exposure, then wariness (as opposed to openness) may enter the consumer's perceptions about the broader coffee-based product category. This suggests that tracking the positive and negative valences of spillover effects among product subcategories will be necessary. Future research should expand the literature on the viability of promoting product subcategory connections in the marketing of wines, looking at the influences of both ingredients and other ingredient-based subcategory products.

#### *4.2. The Role of Health Benefits*

The two factors regarding consumer health related to Hypotheses 4 and 5 were also retained in the final model. As noted, Hypothesis 4 had implied a positive association between consumers' attention to personal health and muscadine wine purchase, based on studies purporting that muscadine grapes have high levels of phenolic compounds. Yet personal attention to health was negatively associated with muscadine wine purchase.

Given that muscadine wine was considered to be a sweet beverage, often with added sugar to accommodate consumer tastes, it makes sense that people who greatly prize their health might be less incentivized to purchase muscadine wine. While sweetness was an attractor for some consumers, it was not a desirable feature for others [50]. Future research should examine the role of attention to one's personal health in a more controlled setting, in order to understand issues such as sugar intolerance, dietary avoidance, and other concerns. The other issue not measured in this study, that should be included in future work on personal health, is attitudes towards the alcoholic content of muscadine wine and related health issues.

On the other hand, results showed that consumers found the health and nutritional benefit claims about muscadines to be more believable than not. Referring to Hypothesis 5, increasing beliefs that muscadines are healthy and natural were positively associated with buying the wine, which supported prior research detailed in this paper about US women desiring nutritional information

on wine labels [34,35]. This is an important finding considering that many fruits already successfully advertise health benefits as a competitive advantage (i.e., pomegranates, avocados, and blueberries). Muscadines have high nutritional value and the nutritional significance of muscadine grapes can be advertised and promoted following government guidelines for fruit labeling (e.g., U.S. Food and Drug Administration [51]). In general, businesses can place statements on labels about health promotion and disease prevention as long as the statement does not suggest that the product can diagnose, cure, mitigate, treat, or prevent a disease.

#### 4.3. *The Role of Patriotic Spending Attitudes*

Lastly, considering Hypothesis 6, there was no evidence that a person's attention to buying US or NC products was associated with buying muscadine wine. It was also uncertain to what extent vendors should advertise the purchase of muscadine wine as an opportunity to express patriotism or support local farmers. While the respondents in this sample were moderately attentive to buying local based on the set of ethnocentrism/patriotic spending psychological items, these beliefs did not convert into muscadine wine purchases. However, in the context of muscadine wine, the localness of the muscadine grape in North Carolina is reinforced by a good story, that of the 'Mother Vine'. It is said that Sir Walter Raleigh's colony discovered the muscadine Mother Vine on Roanoke Island, and it was spread out from there. Thus, while muscadine plants do well in many regions of the Southeast, North Carolina has a strong claim on being the original home of the heirloom grape.

The behavioral principles of storytelling and theory of storytelling as a marketing device are well-established [52]. Storytelling affected conscious and unconscious thinking and beliefs about the product, the brand and the firm [53]. Studies on consuming nostalgia corroborated the effects on consumers of stories about local products. Consumers have been seen to historicize their relationship to food through local consumption since local products were mentally associated with traditions of craftsmanship and artisan production [54]. Thus, perhaps the avenue to take is storytelling, rather than overemphasizing ethnocentric purchase habits of consumers in buying muscadine wine. Producers can play up the cultural aspects of this product and the Southern roots that are associated with it that support other heritage products, for example, sweet tea. Any brand for NC muscadine wine should look to emphasize, the grape's sweetness, its being produced by local farmers, and its value as a heritage product.

## 5. Conclusions

In conclusion, product knowledge about muscadine wine and muscadine-infused products played a key role in the purchase behavior of muscadine wine consumers. Based on the present study, exposure to other muscadine product subcategories can influence consumers to buy muscadine wine. Additionally, consumers' perception of muscadine grape health benefits was positively associated with a purchase decision, while personal attention to health was negatively associated with purchase. This showed that consumer understanding of the actual personal health benefits associated with muscadine wine is a complex issue, compounded by contradictory beliefs about the desirability of sugars and phenolic compounds in the wine.

Overall, marketers should provide education and exposure to muscadine grape products (excluding fresh grapes) and the health benefits associated with muscadine wine. Increased consumer awareness and knowledge in these areas should, based on this study, result in increased muscadine wine sales. Again, knowledge of fresh grapes did not influence consumers' purchase behavior. Using marketing approaches based on the fresh fruit alone as a focus will not make a difference in a consumers' purchase decision.

Findings that attention to buying US or NC products did not associate with wine purchase accentuated the idea that consumer ethnocentrism will vary across food and beverage product categories. This study demonstrated the continuous need for studying niche products and how consumers interact with them and make purchase decisions. For the time being, however, muscadine

wine producers should look at the muscadine wine quality itself and other derivative products to innovate and increase consumer confidence in muscadine wine, rather than spending effort on advertising muscadine grape characteristics or localness of the product.

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