

Beer Me: Investigating Midwest Craft Brewery Demand for Locally-Grown Hops

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Introduction

Unprecedented growth of U.S. craft breweries was observed in the last decade due to rising consumer interest in unique and locally brewed beer (Brewers Association, 2022). A major ingredient in beer brewing is hops. In 2022, there were over 60,000 acres of hops grown in the United States (USDA, 2022). Although over 98% of hops are grown in the Pacific Northwest, hops can be successfully grown in a variety of climates including those in the Midwest (Krebs, 2019). The opportunity for locally brewed beer to be produced from locally grown (LG) hops can support economic and environmental sustainability (Dobis et al., 2019). The purpose of this exploratory research was to identify the factors that influence the use of LG hops by midwestern craft breweries. Research results can inform program development to strengthen Midwest hop farming. Four objectives were used in this research: (1) determine breweries' attitudes, perceived behavioral control, and subjective normative beliefs toward brewing beer from LG hops; (2) classify breweries based on the concept of neolocalism; (3) predict factors that influence breweries' intent to brew beer from LG hops; and, (4) rank breweries' perceptions of barriers to brew beer from LG hops.

Theoretical Framework

The Theory of Planned Behavior (TPB) (Ajzen, 1991) was the leading theory used to guide this research. According to TPB, an individual's likelihood to engage in a specific behavior is related to their intent to complete the behavior. Constructs that influence an individual's intention include attitude toward the behavior, belief of others' attitude toward the behavior, and perceived ability to complete the behavior. Additionally, the concept of neolocalism in craft breweries was utilized (Graefe et al., 2017). Neolocalism can be defined as an intended effort for a business to foster a community-based atmosphere through utilizing local names and images, environmental sustainability, and social and community engagement (Holtkamp et al., 2016). Breweries' purchasing of LG hops may enrich their neolocalism identity.

Methods

A sampling frame of craft breweries was developed through a web search of breweries in 7 midwestern states. Brewery names and email addresses were collected for 214 breweries. A survey instrument was developed and administered through Qualtrics. The survey included 7 sections and 50 questions. Two faculty members in agribusiness and agricultural economics served as panel experts (Rubio, 2005) to review the survey for content validity. Personalized emails and survey links were sent to each brewery using the tailored design method (Dillman et al., 2014). Two questions were used to collect breweries' prior purchasing of LG hops and premium paid. Brewery attitude toward brewing beer from LG hops was collected through a 5-point, 8-item bipolar semantic differential scale modified from Ruth et al. (2019). Perceived behavioral control of brewing beer from LG hops was assessed through 6 items using a 5-point Likert scale (e.g., I would be able to incorporate LG hops in my operation if I desired). Subjective normative belief was assessed through a similar 4-item, 5-point scale (e.g., my local business community would have a favorable view toward us brewing beer from LG hops). Intention to brew beer from LG hops was assessed through a 4-item, 5-point scale. All TPB scales were found to be reliable (.821, .717, .810, .977). Brewery neolocalism characteristics were assessed through 10 Yes/No statements borrowed from Holtkamp et al. (2016). Example statements include "my brewery is named after a local reference" and "local images are used in beer labeling." A rank-order question was used to determine breweries' largest perceived barriers to brewing beer from LG hops (product quality, product taste, consistency of supply, price,

aroma, availability). Lastly, size of enterprise (micro, small, large) and years in operation were collected. The study was approved by Doane University IRB.

Results

We received a total of 23 responses for a response rate of 10.7%. Of the 23 responses, 20 were fully completed for a survey completion rate of 87%. Of the respondents, 14 (60.9%) had purchased LG hops in the past 2 years. Of those who purchased LG hops previously, an average premium of 21.5% ($SD=20.75$) was paid for them, and LG hops accounted for 8.86% ($SD=6.25$) of all hops purchased. **Objective 1.** On average, breweries held a slightly favorable attitude toward brewing beer from LG hops ($M=3.32$, $SD = .73$), believed they had the ability to brew beer from LG hops ($M=3.73$, $SD=.86$), and believed others in their community held favorable views toward them brewing beer from LG hops ($M=3.61$, $SD=.80$). Breweries also had an intent to brew beer from LG hops in the future ($M=3.50$), although relatively high variance was observed between breweries ($SD=1.38$). **Objective 2.** Out of the ten neolocalism characteristics, breweries averaged having 5.05 ($SD=1.80$) characteristics. The most common characteristics were engagement with other local businesses (91.3%) and naming beers using local names and references (65%), while few breweries had sustainability plans implemented (21.7%). **Objective 3.** Constructs related to the TPB and neolocalism were used in a linear regression model to predict breweries' future intent to brew beer from LG hops. The regression model was significant and could be used to explain 68.4% of the variance. The model is illustrated in Table 1 below. Despite the model's significance the only significant predictor variable was attitude.

Table 1. *Characteristics of TPB and Neolocalism on Brewery Intent to Brew with LG Hops*

<i>Predictor Variable</i>	<i>B (coefficient)</i>	<i>SE_b</i>	β	<i>t</i>	<i>p</i>
(Constant)	-2.738	1.267		-2.161	.046*
Attitude	.973	.374	.525	2.598	.019*
Perceived Behavioral Control	.182	.233	.113	.780	.447
Subjective Norm	.559	.343	.342	1.628	.123
Neolocalism	.060	.110	.078	.541	.596

Objective 4. Breweries were asked to complete a rank-order of their largest barriers to them using LG hops. With a maximum possible ranking value of 6, results indicate the product quality ($M=4.35$, $SD=1.72$), product taste ($M=3.85$, $SD=1.50$), and aroma ($M=3.55$, $SD=1.40$) were the largest barriers. The smallest barrier was consistency of supply ($M=2.85$, $SD=1.31$).

Conclusions, Implications, and Recommendations

Our results indicated that breweries held favorable attitudes toward brewing beer from LG hops and believed that others in their community also held favorable attitudes. In addition, they believed they had the ability brew beer from LG hops. Breweries' future intent to brew beer from LG was high. A significant model was produced to predict brewer's future intent to brew beer from LG hops, however, the only significant predictor variable was brewers' attitude. These findings illustrate that brewer attitudes toward LG hops play a significant role in them using LG hops. In addition, the ranking of barriers illustrate that product quality, taste, and aroma are larger barriers over price, available, and consistency of supply. Therefore, these preliminary findings may point toward gaps in the product quality of LG hops. More research and development to improve midwestern hop varieties may be important to improve hop quality. Additional research on consumer preference for purchasing craft beer from LG hops may be beneficial to influence brewers' use of them. The largest limitation to this study was a low response rate. Future research surveying brewery decision-makers may benefit by using alternative methods to collect survey responses.

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