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What is a label worth? Defining the alternatives to organic for US wool producers

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Abstract

Purpose – As sustainability efforts have increased across the apparel and textile industries, consumers are being exposed to an increasing variety of information and label claims. The purpose of this paper is to determine consumer willingness to pay (WTP) for locally produced animal fiber products with organic and alternative labeling schemes, which included eco-friendly, natural and sustainable.

Design/methodology/approach – Experimental auctions were used to elicit bids on wool socks from consumers across three Southern US states. Means were computed for the various bids, as well as bid differences before and after definitions. To test for significance, non-parametric Wilcoxon signed-rank tests for matched pairs were performed for all differences investigated.

Findings – Consumers indicated higher WTP for all versions over conventional wool socks, with the highest WTP exhibited for organic. WTP for organic versions further increased after definitions were provided. Natural and eco-friendly versions had larger premiums than sustainable, but this difference disappeared after definition.

Research limitations/implications – The experimental setting brings the results closer to actual consumer behavior, but eliminated many additional variables that consumers consider.

Practical implications – The results of this paper indicate that policy makers should consider definitions and certification for claims besides organic to potentially benefit wool producers.

Originality/value – This research provides consumer WTP comparisons for a variety of labeling terms currently appearing on wool apparel products. Uncovering this information provides greater understanding of consumer WTP for wool with such attributes, especially after definitions are presented.

Keywords Consumer behaviour, Labelling sustainability, Organic, Eco-friendly, Wool, United States of America

Paper type Research paper

Introduction

Organic production has become the gold standard of the sustainability movement and fashion products have not been an exception to this rule. However, there are situations when the organic standards are not a good fit for textile and apparel. The

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first issue is that organic standards can apply only to natural fibers and products made from natural fibers. Another issue is that the organic standards and certification process administered by the National Organic Program (NOP) under the United State Department of Agriculture (USDA) were designed to cover the production of food and food processing. This means that natural fibers must find a fit within the standards in as much as their production can be related to the production of food. Finally, while the NOP can certify natural fibers as organic, the certification of textile processing falls under a different, much less familiar organic standard, the Global Organic Textile Standard (GOTS). This means that while apparel and textile products can be labeled as "made from organic fibers," they can only be labeled as "organic" if they meet the additional requirements of Global Organic Textile Standard (2011). Another certification system, the OEKO-TEX system, focusses on testing for the presence of harmful substances within textiles with separate certification level, OEKO-TEX Standard 100 plus, that includes certification that the textile was "produced at environmentally friendly production sites" according to their standard (OEKO-TEX® Association, 2013).

Animal fiber producers especially face difficulties with the organic certification system. Their situation is much different from that of cotton, which is also a food product and has been a natural fit for the NOP crop standards. The certification and production of organic cotton has expanded rapidly since the NOP began certifying organic on a national scale in the USA in 2002 (Organic Trade Association (OTA), 2011). In contrast, wool and specialty hair fibers fall under the livestock standards of the NOP, which administer requirements for the production of organic meat and dairy products. US wool producers report great difficulty in meeting the requirements to certify their herds, and hence their wool, as organic. The main issue is that many sheep ranchers cannot find a method of reliably preventing internal parasites without treatments banned for meat production under the NOP standards and that even one treatment for internal parasites with ivermectin, the treatment approved for dairy cows, renders the sheep permanently incapable of producing certified wool no matter how many times the sheep is sheared (Druchunas, 2002).

Facing this difficulty, wool producers have begun to explore alternative labeling schemes that highlight the benefits of their production methods even when one or two elements of those methods fail to meet the NOP standards. A good example of this trend is the Wools of New Zealand marketing program. Rather than organic production methods, the label emphasizes the 100 percent traceability of the fiber as well as the environmental stewardship, the social responsibility efforts and the animal welfare commitments of the participating ranch families (Wools of New Zealand, 2011). Other wool products, made with both imported and domestic wool, are being sold within the USA with claims such as "eco-friendly," "sustainable" and "all natural" and the different producers, manufacturers or retailers selling these products take different steps to define these terms and provide consumers with some level of reassurance as to the validity of the claims. While there is no formal data on the prevalence of these terms in the wool product market, the terms are appearing with greater frequency with the growth of consumer interest in sustainable fashion products and entire companies, such as Teko (2011), have been recently founded just to sell sustainably produced socks.

The objective of this study was to measure consumer willingness to pay (WTP) for organic and alternative labeling schemes for wool products and the impact on WTP of providing definitions for these terms. A further objective was to compare the WTP

for these labeling schemes between USA and imported products to determine if fiber origin has a significant impact on the value of these labels. Understanding the value of these alternative labels will allow wool producers to choose a production approach that presents the best compensation for the costs of implementing production that meets the definition of the label. Given that many US wool producers are not merely unwilling but in fact unable to produce organic wool under the current NOP standards, the results will suggest the potential of alternative labels to present a viable marketing option for these producers.

Organic wool in the USA

With the organic sector continuing to grow in the USA, it is of no surprise that sales of organic fiber have followed suit. According to the OTA (2011), the organic fiber sector experienced a growth of 16 percent from 2009 to 2010, accounting for approximately $605 million in sales. While demand for organic fiber is therefore apparent, production of organic wool in the USA remains relatively small. For example, in 2005, organic wool production was reported at just below 19,000 pounds (Organic Trade Association, 2005).

As noted briefly above, researchers and industry members cite the lack of US organic standards specific to animal fiber production and processing as the main reasoning behind the void in organic wool production. At present, organic wool production falls into the broad category designed for livestock production that fails to address the special nature of wool as an animal by-product. Examples of current standards that create great difficulties to producers include sheep having to be born within the organic system, and the permanent removal of sheep treated with anti-parasite medications. This treatment often occurs before lambs are even born to reduce stress on pregnant ewes and setting aside the first fleece sheared from the lambs would be all that is needed to remove any trace of the drugs from the fiber supply, if that is the intention of the restriction. As a result these organic standards for wool production are more stringent than for other products, such as dairy, where the milk from a treated cow is simply segregated for a set time period (Talley, 2008). The lack of a national organic standard specific to the wool producing sector leaves many sheep farmers and ranchers hesitant to transition to or offer organically produced wool (Druchunas, 2002).

Stolze and Lampkin (2009) explored US organic policy and farming and noted the challenge stemming from the fact that although organic standards are set by policy makers, organic farming was developed by producers and consumers long before the NOP. They argue that current NOP standards may not be meeting the needs of producers and consumers, and propose modifying organic standards, or providing definitions for other labels in the marketplace. Taking these concerns into consideration, should consumers and producers be able to expand the organic standards to fit their needs? In the absence of responsiveness of the NOP to an entire agricultural sector, exploring alternative labeling options to organic is one way for such consumers and producers to express their concern over how well the details of the organic standard meets their needs.

Literature review

Given the specific challenges facing organic wool producers in the USA, it would be vital for producers to know if there is evidence of consumer demand and a higher WTP for an organic wool product. Although at present there are no known

studies investigating consumer WTP for organic wool, there have been several studies concerning consumer WTP for organic foods and at least one study that found consumers willing to pay a premium for organically produced cotton (Hustvedt and Bernard, 2008). Yiridoe *et al.* (2005) conducted a literature review of some and concluded consumer WTP for organic products appears to decrease with premium level. Hughner *et al.* (2007) performed a similar review, and argued consumer interest in organic products varied much in part to a lack of basic understanding for what "organic" means. More recently, Batte *et al.*'s (2007) study in Ohio found consumers were willing to pay price premiums for organic products while Bond *et al.* (2008) concluded consumers place a monetary value on organic production, and may view organic as higher quality. With evidence that consumers are willing to pay a premium for organic foods, a natural extension would be to explore if a similar premium exists for organic wool products.

As an alternative to producing certified organic wool, some producers are choosing to identify their wool as natural or all natural. The term natural does not have an official USDA definition or a certification program. A study of US consumers conducted by Umberger *et al.* (2009) found an increased WTP for beef products designated as natural compared to conventional beef products. However, many of these consumers also exhibited a lack of understanding of the term natural, and associated natural with higher levels of product quality or safety. This lack of consumer understanding for the term natural was also noted by Gifford and Bernard (2011). Their study showed that, prior to information on the standards for natural and organic, many consumers believed both had the same requirements.

While some producers are turning to the term natural because they believe US organic standards for the wool industry to be too stringent, other producers argue that organic production perhaps is not "organic" enough to meet the original intentions of the producers and consumers who developed the organic food industry. In recent years, there has been an argument that organic production is only partially sustainable in practice (Nardone *et al.*, 2004). Agricultural producers have responded by identifying their products under the term sustainable. Honeyman *et al.* (2006) explored the possibility of creating a niche market for pork producers through the use of a "Sustainable Pork" label. However, there is currently no official USDA definition for the term. Researchers such as Nardone *et al.* (2004) have previously stressed the need for a formal description and definition as to what sustainable is.

The growing number of labeling options currently available includes the alternative eco-friendly. In response to consumer demand for eco-friendly labeling, the EU created an "Eco-label" which is slated toward the textile industry (Padula, 2008). The EU label does have a certification process, which is concerned with the sourcing of the wool fiber, cleaning, spinning, dyeing, and finishing of the fabric. As with the other potential alternatives to organic, the USDA does not have a formal definition for environmentally friendly.

Finally, while Hustvedt *et al.* (2008) did not specifically examine WTP in their study of labeling for wool products, they did determine that alternative labels such as eco-friendly and animal-friendly were competitive with organic labeling for specific segments of consumers, which again suggests that the current organic label does not meet all of the needs of consumers, such as those consumers concerned with animal welfare. Sheep ranchers in the USA are exploring the potential benefit of animal welfare certification and Certified Humane, one of the main animal welfare certifies for

food products, does have a protocol to certify humane production of sheep (Certified Humane, 2011).

While the labeling alternatives discussed above focussed on the labeling of production attributes, there is also potential consumer interest in labeling for fiber origin. Labeling apparel for fiber origin, while not required, is allowed by the Federal Trade Commission (FTC) regulations for mandated clothing labeling (Federal Trade Commission, 1999). Consumer WTP for or attitudes toward fiber origin labeling have been the focus of extensive research involving food products (Loureiro and Umberger, 2003; Insch and Florek, 2009) and other consumer goods (Maronick, 1995). One study of consumer WTP for fiber origin labeling (Hustvedt and Bernard, 2008) found that some consumers were willing to pay roughly 10 percent more for cotton socks labeled as "made with Texas cotton" than a generic pair, but no significant premium associated with labeling for "made with US cotton." Given that there is not yet enough organic wool production in the USA to support product differentiation based on region of production, a comparison between consumer WTP for USA and imported wool would likely be better suited for investigation at this time.

In summary, as with other issues related to organic production, the food sector has been leading the way in the exploration of alternatives to organic labeling. Various studies suggest that these labels meet consumer needs and the persistence of this issue suggests that the deficiencies of the organic labeling system for certain product categories remains to be addressed by the USDA. A study that allows consumers to directly express their WTP for the alternatives alongside organic and conventional products would be able to provide guidance for wool producers seeking to choose the best labeling scheme for their products. By testing WTP for wool products before and after the provision of a definition for each label, this study is able to measure the level of benefit from providing a specific definition for terms that are not yet universally defined.

Methodology

The objectives of this research were accomplished using experimental auctions. Over the past decade auctions have been used to determine consumer WTP for such products as genetically modified foods (Huffman *et al.*, 2007; Bernard and Bernard, 2010), food safety and health information (Marette *et al.*, 2008), bison meat (Hobbs *et al.*, 2006), and T-shirts (Hustvedt and Bernard, 2010). While auctions are one of many different methods that exist for determining WTP, they have key advantages over more general methods such as surveys or focus groups[1]. The main advantage of auctions is that the consequences to the participants in revealing their WTP are real whereas most other methods are hypothetical in nature. The concern with hypothetical methods specifically is that some consumers may indicate a high WTP knowing that there are no monetary consequences for doing so. Studies such as List and Gallet (2001) have found that this hypothetical bias can lead to WTP estimates from two to 20 times greater than those found using non-hypothetical methods.

With a non-hypothetical situation, participants understand that they must be careful with the WTP they reveal as they may end up purchasing the product being investigated at a real cost. The use of real money removes the inconsequential nature of typical surveys. Another advantage of auction experiments is that they are incentive compatible, meaning that it is the participants' best strategy to reveal their true values. Most versions of the auctions used stem from Vickrey's (1961) incentive compatible second-price auction. In the original version, the highest bidder purchases the item but

pays a price equal to the second highest bid. The fact that a participant never actually pays what they bid eliminates the tendency to try and lower bids to get a better deal that might exist otherwise[2]. This research uses a slight variation that allows for more purchasers to keep the group of consumers engaged in the experiment (for more details see Lusk and Shogren, 2007).

The auction experiments were conducted early in 2011 across three southern US states. Participants were recruited via ads in local newspapers, various online sources, at local community centers, colleges and churches. The ads referred to the experiment as a "fiber marketing study" but did not go into specifics to avoid creating a biased sample (e.g. attracting those just interested in organic issues). In total, 255 participants took part with 85 in Virginia, 95 in Georgia, and 75 in Texas. The locations were Alexandria, VA, Athens, GA, and San Marcos, TX. Sessions lasted an hour and a half and participants received $50 for taking part, plus any extra earnings in a practice auction, minus money for any sock purchases.

All sessions were conducted in computers labs so that participants could use the Qualtrics survey system during the auction. Each session began with a computer-based questionnaire designed to collect information on subject's purchasing habits for clothing, shopping frequency and opinions and attitudes toward several related statements measured on a seven-point Likert scale. This was followed by a detailed presentation on the auction mechanism, the Vickrey fifth-price auction (i.e. the four highest bidders receive the item, each paying the price of the fifth highest bid), including examples illustrating the potential to miss out on profits by underbidding or to lose money by overbidding. To ensure the mechanism and the best strategy of bidding your true value were understood, a practice auction was conducted using induced values. The computer randomly generated an induced value for each person between $0.00 and $1.00 and each person bid against computer generated players. As noted, these were also non-hypothetical allowing some participants to earn a few cents extra. Nearly all subjects bid their induced value demonstrating that the strategy was well understood.

Once it was concluded that everyone understood the mechanism, the sock auctions were explained. This entailed three other pieces of information. Most importantly, it was explained that while many auctions would be conducted only one would be binding. The binding auction was randomly determined prior to the session and the results sealed in an envelope placed in the front of the room following Bernard and Bernard (2009). The random, unknown component forces participants to treat all auctions as real while only having one auction count prevents people from lowering their bids purposely to avoid buying too many socks. Second, it was stressed they should enter their values for the various socks and not what they thought they may cost in a retail outlet. Lastly, it was announced that there was a bid limit of $10 for each pair of socks.

Next, pairs of wool socks were auctioned off in ten different versions. These were identified by production method which had five different levels (conventional, sustainable, all natural, eco-friendly, and organic) with two origin levels each (USA and imported)[3]. All socks were visible to participants at the front of the room but handling them was not permitted. Participant bids were entered privately on their computers and not visible by anyone else.

When that round of auctions was concluded, definitions of each of the production terms above were presented. The text of these as shown in the sessions is displayed in Table I. In preparing these, organic was the most straightforward as it was based

Term	Definition/explanation
Organic	Items must be certified to the USDA's organic standards, and must be inspected and certified before labeling. This means no synthetic pesticides, hormones or antibiotics, no irradiation, no artificial coloring or genetically modified (GM) ingredients, and no petroleum or sewage sludge fertilizers. Organic also means that animals were fed organic fed, and had access to pasture or the outdoors
Sustainable	The wool was produced using a ranching system that is capable of being continued with minimal long-term effects on the environment. This includes the management of natural resources, animal health, and the welfare and well-being of ranching families
Eco-friendly	The wool was produced with minimal impact to the environment
All natural	This wool is a renewable fiber that comes from a natural source, and was processed with non-hazardous, low-impact chemicals and dyes
Conventional	Most products fit in this category, meaning they are not produced locally and do not meet the requirements of organic. They may have been produced using antibiotics, hormones, GM, pesticides, and chemical fertilizers, but all with government approval and within government standards and limits

Table I.
Terms as presented to auction participants

on the guidelines under the NOP. In addition to the text, participants were also shown the USDA organic logo. Conventional was explained by listing the allowable and typical practices used in modern agriculture. As noted, however, for the remaining production techniques there were currently no regulated, or even commonly accepted, definitions. This includes natural, which, despite appearing often on food products, is only regulated for meat and poultry products where it deals primarily with processing requirements. The definitions for these were developed by examining how the terms were defined by the producers, retailers, and manufacturers who used the terms and provided further discussion of the terms in their marketing material. Because an additional goal of the study, not examined here, was to explore the marketing of fiber by state-level origin, ranchers in each state where sessions were conducted were also interviewed about their production methods to determine the ability of the chosen definitions to be applied to their wool products[4]. In order to reassure participants that each sock in the auction was accurately labeled, socks made in the USA from both domestic and imported fibers were sourced from a variety of manufacturers who were willing to make both fiber origin and specific production method claims in their marketing materials.

After the definitions had been discussed, the same ten versions of the wool socks were auctioned again. Importantly note that no information regarding anyone's bids from the earlier round were revealed in order to avoid the possibility of bidder affiliation. The specific concern would be participants adjusting their values to follow what others did as has been found in Harrison *et al.* (2004) and Bernard (2005).

Once the auctions were concluded, participants were asked to complete another set of questions, including their demographic information. When everyone had finished, a volunteer opened the envelope and announced to the group which auction was binding. At that point, the final price and the four purchasers were determined and given the appropriate socks. Sessions ended with participants being paid and thanked for taking part.

Results and discussion

The mean bids for the ten socks for both the before and after definition rounds are displayed in Table II. A few points regarding the bids were quickly apparent. First, as

Origin	Attribute	Average bid ($) Before definition	After definition	Difference	p-value
Imported	Conventional	2.16	1.96	−0.20	*0.0011*
	Eco-friendly	2.90	2.92	0.02	0.6810
	All Natural	2.97	2.94	−0.03	0.5240
	Organic	3.11	3.36	0.25	*0.0043*
	Sustainable	2.75	2.92	0.17	*0.0156*
US	Conventional	2.28	2.14	−0.14	*0.0031*
	Eco-friendly	3.16	3.15	−0.01	0.8763
	All natural	3.17	3.16	−0.01	0.7355
	Organic	3.31	3.50	0.19	*0.0035*
	Sustainable	2.90	3.10	0.20	*0.0004*

Notes: p-values obtained from non-parametric Wilcoxon signed-rank tests for matched pairs. p-values in italics are significant at the 5 percent level or better

Table II.
Average bids by origin and attribute; before and after definition

expected, the bids for the conventional versions were the lowest in all four cases, often by a substantial amount. The organic versions, also in line with expectations based on the current shape of the market, had the highest WTP. While bids for the all natural versions were the next highest, in most cases these values seemed indistinguishable from eco-friendly and not overly beyond mean WTP for sustainable versions.

Table II also includes analysis of the difference in bids for each pair of socks before and after definitions. Since auction bid data is typically not normally distributed, Shapiro-Wilk tests for normality were first performed on the different version variables (see He and Bernard, 2011). The results of these tests indicated rejection of normality for all of the bid series at better than the 1 percent level. Given this, non-parametric Wilcoxon signed-rank tests for matched pairs were performed in lieu of paired t-tests for all differences investigated. Consistent across both origin groups, having definitions significantly altered the mean WTP for the conventional, organic, and sustainable sock versions but not the eco-friendly or natural versions. Conventional was the only production method for which bids decreased significantly once participants read the definitions. There could be two possible reasons for this decline. First, being reminded of some of the aspects of conventional production that may be viewed negatively, such as pesticides and antibiotic use, many participants may have rethought their opinion. In contrast, the descriptions of some of the other versions may have made them more attractive enough that interest in conventional fell.

The significant increase in bids for the organic versions after definition showed the importance of making certain that consumers understand the definition of organic. This backs previous studies showing that while most people are well aware of organic it is a much smaller group that well knows the attributes required (Hughner *et al.*, 2007). It appears therefore that producers could benefit substantially by increasing consumer knowledge regarding organic fiber. The increased WTP for sustainable wool socks also suggested benefits for explaining the meaning of this claim in the marketplace. While, as noted, there is little consensus on a definition these findings demonstrated a strong potential for the wording proposed as a starting point.

The premiums between the different production methods, again both before and after definitions were given, appear in Table III. As with the findings in Table II, the patterns of significance were the same across both origins, imported and domestic.

Origin	Attribute	Comparison	Before definition Difference ($)	Before definition p-value	After definition Difference ($)	After definition p-value
Imported	Conventional	Eco-friendly	0.74	*<0.0001*	0.96	*<0.0001*
		All Natural	0.81	*<0.0001*	0.98	*<0.0001*
		Organic	0.95	*<0.0001*	1.40	*<0.0001*
		Sustainable	0.59	*<0.0001*	0.96	*<0.0001*
	Organic	Eco-friendly	−0.21	*0.0001*	−0.44	*<0.0001*
		All natural	−0.14	*0.0013*	−0.42	*<0.0001*
		Sustainable	−0.36	*<0.0001*	−0.44	*<0.0001*
	Eco-friendly	All natural	0.07	0.7257	0.02	0.9826
		Sustainable	−0.15	*0.0144*	0.00	0.7215
	Sustainable	All natural	0.22	*0.0052*	0.02	0.3864
US	Conventional	Eco-friendly	0.88	*<0.0001*	1.01	*<0.0001*
		All natural	0.89	*<0.0001*	1.02	*<0.0001*
		Organic	1.03	*<0.0001*	1.36	*<0.0001*
		Sustainable	0.62	*<0.0001*	0.96	*<0.0001*
	Organic	Eco-friendly	−0.15	*0.0036*	−0.35	*<0.0001*
		All natural	−0.14	*0.0040*	−0.34	*<0.0001*
		Sustainable	−0.41	*<0.0001*	−0.40	*<0.0001*
	Eco-friendly	All natural	0.01	0.7433	0.01	0.9260
		Sustainable	−0.26	*<0.0001*	−0.05	0.7008
	Sustainable	All natural	0.27	*0.0013*	0.06	0.5895

Table III.
Bid differences between attributes by origin – before and after definition

Notes: p-values obtained from non-parametric Wilcoxon signed-rank tests for matched pairs. p-values in italics are significant at the 5 percent level or better

For the most part, the level of significance for differences among the production methods was also consistent across the definition treatments. Most apparent here were the consistent premiums for all the other methods over conventional at better than the 1 percent level of significance. It was obvious from these results that consumers do have a clear WTP for products that go beyond conventional fiber production practices.

Introducing the definitions did lead to a clearer differentiation when comparing organic to the alternatives. For example, prior to the provision of definitions, all natural was receiving a premium that, while significant at the 5 percent level, was only 14 cents less than the premium for organic. Afterwards, however, the substantially increased organic premium was significant at the 1 percent level compared with all of the alternatives. This echoed previous studies such as Gifford and Bernard (2011) that have shown a large percentage of consumers often equate natural and organic. While this lack of knowledge may be benefiting producers marketing their fibers as all natural it shows the potential benefit organic producers should be trying to capture by ensuring their production attributes are more apparent and better differentiated.

The two comparisons that changed after definitions involved the sustainable claim. In both cases, there had been a significantly lower WTP for sustainable prior to the definitions. One of these was with all natural, where the advantage of the latter vanished once consumers were better able to understand the two methods. The eco-friendly claim also lost its advantage over sustainable to the point where, for the socks of both domestic and imported origin, there was no difference in the mean bids between sustainable and the other alternative labels. The only two production methods for which no significant differences appeared in either set of auctions were eco-friendly

and all natural. As seen in Table II earlier, these were additionally the terms least effected overall by the definitions.

An additional goal of the study was to determine if there were differences in the levels of WTP for any of these labels when fiber origin was taken into consideration. An examination of Table II reveals that the pattern of premiums for the two fiber origins were substantially similar. In fact, the direction of and significance of change for each of the labels following the provision of definitions was identical, with conventional losing, organic and sustainable gaining and eco-friendly and all natural remaining unchanged. This suggests that there is no meaningful interaction between any of the production methods and the origin of the fiber.

Conclusions and implications

While organic standards are now implemented and certified by government policy makers, organic farming has its origins in concerns by both producers and consumers about the nature of agriculture (Stolze and Lampkin, 2009). Organic producers and consumers should be equal participants in a dynamic that maximizes the ability of both parties to foster agricultural production that meets their goals; goals that traditionally included both environmental protection and animal welfare. The persistence of alternatives to organic, and the inability of an organic market for organic wool produced in the USA to develop, both suggest that policy makers should take a serious look at NOP standards, and reconsider how they are applied to producers who are raising sheep for wool instead of for meat consumption.

The results of this study provide evidence of an increased consumer WTP for organic-labeled wool compared to all other labeling versions investigated. For wool producers who have not found transitioning to organic certification feasible, this study also supports the suggestion that policy makers in the USA should explore creating an official definition for the terms sustainable and eco-friendly, either by the USDA or by the FTC. Compared to conventional wool, there is evidence that providing consumers with a set definition for both eco-friendly and sustainable would increase WTP for products bearing each label. The definition of sustainable used for this study was consciously crafted to reflect the addition of social and economic sustainability concerns demonstrated by the producers and retailers using the term and the addition of these concerns, made apparent through the definition, resonated for the participants. Just as research into the market for locally produced food products has identified consumer interest in the economic and social value of their connection to agriculture (Hinrichs, 2000), the success of this definition of sustainability should provide strong direction for fiber producers and apparel manufacturers who are looking into alternatives to organic labeling. The development and testing of a definition for sustainable in the apparel market is a major contribution of this study.

Although formal definitions are available for organic and, to a lesser extent, all natural, results also suggest that improving consumer understand of the meaning behind these terms could influence WTP. In the case of organic, findings here indicate a significant price premium increase for organic wool products after consumers are presented with the official definition for the term. Future research should explore whether this increase is due to consumer uncertainty about the applicability of organic standards to non-food products.

Policy makers aiming to foster domestic wool production should take into account the potential value of domestic consumer WTP for wool products bearing the production labels examined in this study. If a set of organic standards specific to wool

production were to be introduced, coupled with evidence of consumer WTP for organic wool, producers would have a more solid foundation from which to justify the switch to organic. With such a large proportion of domestic wool currently being exported, the results found here suggest there is the same increase in WTP premium for a US wool product designated as either organic, sustainable, eco-friendly, or all natural as being currently enjoyed by the greater number of overseas producers who are providing the vast majority of wool sold in the USA. However, current production barriers such as the lack of suitable organic standards are likely preventing the domestic market for such labeled wool products to fully develop.

A natural extension from this study would be to instead focus on consumer WTP for wool products designated as having been processed under the same labeling attributes included here. The recently ratified GOTS is utilized by firms processing imported organic wool to sell to US apparel manufacturers. Should domestic organic wool production increase in the future, it would be vital for producers and processors to understand the economic benefits of marketing products that are both produced with organic fiber and with a certified organic processing method. Exploring how the price premium for wool products that have been organically produced and processed interacts with premiums for domestic fiber origin would be of interest to industry members and policy makers aiming at increasing wool production in the USA.

Notes

1. See Lee and Hatcher (2001) or Lusk and Hudson (2004) for a review of the strengths and weaknesses of different WTP methodologies.
2. The auction is theoretically equivalent to the open-outcry auctions typically used for art or wine. Note in such auctions the purchaser also pays the second highest bid (i.e. where the last remaining other bidder drops out). A disadvantage in the outcry system is that the true WTP of the top bidder is never revealed. The second-price auction thus uses sealed bids where everyone's values are written and collected.
3. Some additional auctions with socks labeled by state marketing programs were conducted but are not included in this analysis since a complete set for all the states could not be collected. This was since a tenet of experimental auctions is that researchers must not use deception and some of these options were not feasible.
4. Wool purchased from these ranchers was processed, spun and knit into socks by a US manufacturer with care being taken to ensure the origin of the fiber in each sock could be traced back to the states where the sessions were conducted. The socks were dyed using a low-impact dye to ensure that the resulting socks would fully meet the definitions provided to the consumers. These socks were included in the auctions to measure WTP for state-level fiber origin, the subject of an upcoming paper.

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