American Farmers’ Attitudes toward China and the U.S.–China Trade Dispute: A Mediated Relationship

RESEARCH ARTICLE

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Abstract

The trade dispute between the U.S. and China significantly cut agricultural product sales to a major foreign market and drastically hurt Midwest farmers’ pocketbooks. To explore Midwest farmers’ attitudes toward China and the trade dispute, we surveyed 693 farmers in Illinois, Iowa, and Minnesota. We found that farmers’ attitudes toward China were generally unfavourable; farmers were also somewhat pessimistic about the outcome of the trade dispute. Additionally, we found that farmers’ attitudes toward the trade dispute were driven by their disposition toward China, the information they obtained from interpersonal and media sources, the perceived credibility of media sources, their propensity to take on risks, income, and years of farming. Farmers’ attitudes toward China, on the other hand, were influenced by the degree to which they saw information sources as credible. We also found that farmers’ attitudes toward China played a mediating effect in the positive impact of media credibility on farmers’ attitudes toward the trade dispute.

Keywords: agricultural trade policy, information sources, media credibility, Midwest farmers, U.S.–China trade war

JEL-codes: F190, F100

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1. Introduction

The U.S. trade relationship with China has supported roughly 2.6 million jobs across a range of industries in the United States (Oxford Economics, 2017). In the burgeoning Chinese middle class, expected to outnumber the entire U.S. population by 2026, American companies find a lucrative customer base that can boost domestic employment and drive economic growth (Oxford Economics, 2017). This partnership, however, has been long bedeviled by American concerns about lopsided trade and worries about patent and intellectual capital infringement. Tensions came to a head when the Trump administration imposed its first salvo of tariffs against Chinese goods in early 2018 (Liu and Woo, 2018). Several rounds of talks the following year failed to avert another round of tariffs on Chinese products worth more than $250 billion by June (MacDonald, 2019). The Chinese retaliated with duties on more than $110 billion worth of American goods, including agricultural products such as soybeans, pork, and ethanol (Zhang, 2019). In August, China announced duties on $75 billion worth of U.S. products after President Trump increased tariffs on Chinese imports worth $300 billion (Rodger and Perry, 2019).

China used to be the top market for many U.S. agricultural products, such as soybeans, grain sorghum, cotton, and hay (Farm Credit Administration, 2018; Foreign Agricultural Service (FAS), 2019). In 2017 alone, 57% of U.S. soybean exports and 78% of exported sorghum went to China (Farm Credit Administration, 2018). However, China’s retaliatory tariffs, which covered almost all agricultural exports, dealt “a body blow to the farming sector that is already struggling to get by” (Rodger and Perry, 2019: para. 1). By mid-2019, U.S. soybean exports plummeted to their lowest level since 2002, pork exports dipped to a nine-year low, and shipments of sorghum went down 96% from 2015 levels (FAS, 2020). Corn and soybean futures prices tumbled (Reuters, 2020) as the two countries traded blows instead of goods.

Delays in reaching an agreement made it hard for farmers to hold on in the face of rising bankruptcy rates, up 24% by October 2019 compared to the year before (American Farm Bureau, 2019). But although American farmers have borne the brunt of this trade dispute, surveys (e.g. Herath, 2020; Morris, 2019) continued to show strong support for President Trump’s push to rewrite the terms of trade with China, partly due to a Market Facilitation Program that released $25 billion to bail out American farmers (Farm Service Agency, 2020; Janzen and Hendricks, 2020; Zhang et al., 2019). Farmers were adamant, however, that they prefer trade from aid, cognizant that markets, once lost, may never be fully recovered (Zhang, 2020).

The two countries have since signed partial trade agreements in which the U.S. consented to relax tariffs on select Chinese goods in exchange for Beijing’s promise to buy more American products and give greater protection to American intellectual property, among other provisions (Reuters, 2020).

Given the importance of the agricultural trade relationship between these two economic giants, this study aims to assess American Midwest farmers’ attitudes toward China and its trade tiff with the U.S. and determine the antecedents of these attitudes. We ask: What are farmers’ attitudes toward China and the U.S.–China dispute? What factors significantly influenced farmers’ attitudes toward China and its trade dispute with the U.S.?

We focus on Midwest farmers’ perceptions because their livelihood was most adversely affected (Balistreri et al., 2018). The U.S. Midwest is a highly intensive production area for multiple row crops and livestock. Many of its farmers depend on foreign export markets, especially China (Illinois Farm Bureau, 2020). How they perceive the dynamics of disagreements and clashes with major trade partners may have a profound influence on future farming decisions and the level of support they assign to the national leadership and its trade policies. Soliciting farmers’ viewpoints can assist policymakers, envoys, and trade negotiators to realistically forecast the immediate and long-term impacts of trade disagreements in human terms and in formulating regulations and solutions to nagging trade concerns. Ascertain that the factors which influence farmers’ attitudes will provide risk communications and crisis communication strategists insights on how to manage the communication response that will meet the information needs of different audience segments and stakeholders.
2. Literature review, conceptual framework, and hypotheses

An attitude is a negative or positive belief or evaluation an individual holds about a person, object, event, or entity (Ajzen, 2005). A person’s attitude has cognitive and affective dimensions, and implicitly or explicitly involves notions such as good/bad, right/wrong, ought/ought not (Ajzen, 2005). In the case of people’s attitudes about a country (in this case, toward China), these include direct personal experience, observations of how a nation’s citizens behave in a particular role or context, and social norms involving society’s rules for what behaviors are considered appropriate (Xie and Jin, 2021). Attitudes also can be learned in a variety of ways, including through people’s exposure to different information sources (Gries and Crowson, 2010). A number of factors influence how attitudes form. Therefore, based on a review of the literature, we proposed a framework to demonstrate how American farmers’ attitudes toward China and the U.S.–China trade dispute were shaped (Figure 1). We detail the concepts and attitudes toward China hypotheses in the following paragraphs.

The U.S. public’s attitudes toward China have vacillated over the years, but the Pew Research Center (Silver et al., 2019; Silver, 2022) reports that public opinion has become more and more unfavorable since 2019, based on 17 years of polling on the topic. The results of their surveys showed that just as many Americans regarded China as the greatest threat to the U.S. as those who ranked Russia as America’s top rival. Unfavorable views of China jumped from 47% in 2018 to 60% in 2019 (n=1503), and this number continued to increase to 82% in 2022 (n=1897). Negative ratings correlated with the escalation of the trade conflict with China, which has seen President Trump and his administration officials frequently complaining about China’s large trade surplus, methods of forcing intellectual property acquisition, unfair practices in the global economic space, and its threats to U.S. national security (Liu and Woo, 2018; U.S. Department of Defense, 2019). Thus, like other scholars who have examined China-U.S. relations (e.g. Gries and Crowson, 2010; Gries et al., 2010; Jin et al., 2022), we generally frame American farmers’ attitudes toward China in a negative light (unfavorable) in this study.

Figure 1. Conceptual framework and hypotheses.
2.1 Attitudes toward the U.S.–China trade dispute

We define farmers’ attitudes toward the U.S.–China trade dispute as their individual judgment or normative view about the anticipated outcomes of the trade dispute. Farmers may apply a purely economic prism to this issue, leading to concerns about its impact on their pocketbooks, the farm sector, and the national economy (Anderson, 2010; Viskupić et al., 2022). On the other hand, they may see the trade war as the first genuine effort by the U.S. government “to thwart China’s [unfair] economic practices and boost the U.S. economy” (Boylan et al., 2021, p. 23). These viewpoints may undergird their support or rejection of the Trump administration’s trade policy and actions with respect to China. We therefore hypothesize that:

H1: Farmers will have more positive attitudes toward the trade dispute when they have more unfavorable attitudes toward China.

2.2 Knowledge about the trade dispute

The hierarchy of effects model (Lavidge and Steiner, 1961) suggests that the more people know about a topic or object, the more likely they are to develop positive attitudes about it, and eventually be more motivated to act toward the topic in responsible ways. However, this assertion has been questioned frequently in empirical studies (e.g., Fabrigar et al., 2006), leading scholars to conclude that attempts to change public knowledge are both unsuccessful and not needed (e.g., Brossard et al., 2005; Kelly and Barker, 2016) for attitudes to change. However, being aware of an issue is the first step toward developing an effective and evaluative attitude about it — what Forsyth et al. (1997) term as “appraisal.” Although knowledge itself is not sufficient to motivate support for an issue, it is considered a valuable goal in and of itself. “Having extensive knowledge about an issue should allow people to form new attitudes on those bases” (Kumkale et al., 2010, p. 1326). We therefore hypothesize that:

H2: Farmers will have more positive attitudes toward the trade dispute when they know more about it.

2.3 Information sources

Farmers draw on multiple sources of information to learn about production and marketing options, among other topics. To them, mass media and interpersonal sources offer valuable information to help in making farm management decisions (Gloy et al., 2000; Rogers, 2003). Both categories of information sources also have significant effects in shaping political views and attitudes (Desmet et al., 2015; De Vreese and Boomgaarden, 2006).

Interpersonal sources

Historically, much of farmers’ needed information has come from interpersonal sources such as agricultural extension agents, university professors, other farmers, fertilizer dealers, crop consultants, seed suppliers, and meetings hosted by growers’ associations or commodity groups — a preference that still persists even with the advent of online and other digital sources (Coldevin, 2003; Houser et al., 2019). According to De Vreese and Boomgaarden (2006), interpersonal communications, either among individuals or in groups, help people form a better understanding of political issues, which may lead to significant changes in attitudes. Although it is not clear if interpersonal communication reinforces or erodes individuals’ political attitudes (De Vreese and Boomgaarden, 2006), scholars (e.g. McCroskey et al., 1975; Rogers, 2003) have argued that the effectiveness of interpersonal encounters depends largely on the degree to which those who interact are homophilous. Therefore, we propose two reinforcing relationships:

H3a: Farmers who use more interpersonal communication sources for information about the trade dispute will have a more unfavorable attitude toward China.

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H3b: Farmers who use more interpersonal communication sources for information about the trade dispute will have more positive attitudes toward the trade dispute.

Mass media sources

Mass media sources (such as magazines, radios, TVs, and the internet) have long served American agriculture (Gloy et al., 2000), and will continue to do so as social media increasingly become the prime news source for Americans (Shearer, 2018). Informal learning can occur through exposure to media that help audiences form attitudes about issues (Brossard and Nisbet, 2007; McBride and Daberko, 2003). Mass media exposure has been linked to concern about controversial topics, an assertion consistent with agenda-setting theory, which posits that frequency of news coverage affects issue salience for the public (McCombs and Shaw, 1972). Given considerable media attention to the trade dispute, cultivation effects may also have significantly influenced how American audiences see China (Shrum, 1999). Scholars (e.g., Gries et al., 2010; Peng, 2004; Zhang, 2016) have observed that popular U.S. media outlets perpetuate constant negative narratives about the country, and regardless of the veracity of these representations, predominantly negative coverage drowns out the positive elements of Chinese life and business practices. Thus, Gries et al. (2010) argue that media exposure plays a role in shaping Americans’ negative attitudes towards China by, for example, justifying the tough trade sanctions against a “rogue” trade partner. Therefore, we posit that:

H4a: Farmers who use more mass media sources for information about the trade dispute will have more unfavorable attitudes toward China.
H4b: Farmers who use more mass media sources for information about the trade dispute will have more positive attitudes toward the trade dispute.

2.4 The credibility of information sources

Another potential antecedent of attitudes is an individual’s willingness to believe some information sources and channels more than others. Studies in persuasion have shown that the credibility of a source — whether media or interpersonal — influences attitudes about the topic advocated by that source (e.g., Kumkale et al., 2010).

Credibility of interpersonal communication sources

Credibility, argues Chaffee (1986), is ascribed to sources that audiences believe will be most likely to convey information relevant to the topic at hand. Not surprisingly, studies suggest that farmers trust different sources for specific kinds of topics. For instance, a regionally representative survey of 900 inland Pacific Northwest farmers revealed that they trust other farmers and agribusiness entities most for production management decisions, but trust university Extension most for climate change information (Borelli et al., 2018). Simons et al. (1970) argues that the similarity between the communicator and the receiver tends to increase the volume of interpersonal communication, which then boosts the perceived credibility of interpersonal sources, and finally enhances the attitude of audiences toward the position being advocated by the source. We thus conjecture that interpersonal sources have a more influential impact on farmers’ attitudes about the trade war by virtue of the sources’ proximity and similarity to their audiences. Given the overall negative disposition toward China by most American actors involved in the trade dispute, we posit, as a corollary, that greater perceived credibility of interpersonal sources will contribute to developing a more negative disposition toward China along with more positive attitudes toward the trade dispute. We therefore propose that:

H5a: Farmers who perceive interpersonal communication sources as more credible will have more unfavorable attitudes toward China.
H5b: Farmers who perceive interpersonal communication sources as more credible will have more positive attitudes toward the trade dispute.
**Credibility of mass media sources**

The perceived credibility of mass media sources has been found to influence audiences’ attitudes toward a topic or issue (Zha et al., 2018) although the direction of effects can vary. Judging by the assessments of business and market journalists, media performance in covering U.S.–China relationship leaves much to be desired. For example, Phillip Yin, manager-director of Newsroom Investments and former anchor for CNBC and Bloomberg News, thought that...
principal operator to respond to an online questionnaire administered February to April 2019. We first mailed an invitation letter on March 14 with the URL of the online survey and an access code unique to each respondent. The online survey remained live until May 31. Following the Tailored Mixed-Mode Survey Design method (Dillman et al., 2014), we mailed two follow-up questionnaires in paper format to those who did not complete the online version on April 15 and May 7. We closed data collection on May 31. Our questionnaire elicited farmers’ attitudes toward China and its trade dispute with the U.S., knowledge of the trade issue, their communication behaviors and perceptions of the credibility of information sources, their marketing and risk management practices (not included in this study), and their farming and demographic characteristics. The online and mailed surveys yielded 794 responses, resulting in a response rate of 26.5%. Of these, 693 were deemed usable for statistical analyses.

3.2 Variables and their measurement

Dependent variables

To measure attitudes toward the trade dispute, we asked farmer-respondents to indicate their level of agreement with nine statements using a five-point Likert scale (1=strongly disagree to 5=strongly agree). Seven other items were developed to measure farmers’ attitudes toward China using the same five-point Likert scale. We then conducted principal component analysis (PCA) on a total of 16 attitudinal items, a widely used practice to construct composite indexes (e.g., Khatri-Chhetri et al., 2020; Niles et al., 2016). We aggregated the scales into two indexed variables based on the factor loadings via the weighted arithmetic mean. The weighted mean approach recognizes the strength of factor loadings while retaining the scale metric that allows for straightforward interpretation (DiStefano et al., 2009). The indexed variables (denoted as attitudes toward China and attitudes toward the trade dispute) were the dependent variables of later regression models.

Explanatory variables

Knowledge about the trade dispute. We developed three multiple-choice questions to assess the level of farmers’ knowledge about the agriculture-related aspects of the trade dispute: (1) To the best of your knowledge, what percent of tariff did China impose on U.S. soybean exports in July 2018? (25%); (2) What percent of U.S. soybean exports were shipped to China in July 2017? (60%); (3) What was the payment rate for soybean producers? ($1.65 per bushel). Farmers’ overall knowledge level about the trade dispute (denoted as knowledge) is the number of questions correctly answered, which ranges from 0 (no question was answered correctly) to 3 (all three questions were answered correctly).

Information sources. We measured how frequently farmers sought information about the trade issue with China from a list of seven mass media and four interpersonal sources using a five-point Likert scale (1=never to 5=all the time). Cronbach’s α values (≥0.7) suggest that the first seven items reliably measured the frequency of using mass media sources to be informed about the trade dispute, while the remaining four reliably measured frequency of using interpersonal sources. Thus, we created two indexed variables (denoted as interpersonal communication and mass media) by averaging the responses to the items that comprise each construct.

Perceived credibility of information sources. We asked farmers to rate the extent to which they perceive seven mass media sources and four interpersonal sources as credible on a five-point scale (1=very poor credibility to 5=very high credibility). Given strong reliabilities, two indexed variables (denoted as interpersonal credibility and media credibility) were created by averaging the responses to the items comprising each construct.

Willingness to take risks. Two items tapped farmers’ willingness to take risks. The first asked about their general propensity to take risks; the second assessed their willingness to take risks specifically in their farming operations. Both items were measured on a seven-point Likert scale (1=not willing to take risks at...
all to 7=very willing to take risks) following Zhang et al. (2016). We averaged the responses to create an index (denoted as risk) for later regression models.

**Control variables**

We included two farming characteristics as control variables: the acreage of farming operation (farm size) and gross farm income (farm income). Farmers’ gross farm incomes were measured by using six-point ordinal integers: $30,000; $75,000; $175,000; $375,000; $750,000; $1,500,000. To retain the increments among six income ranges, we assigned values to each option by using the range’s median. We also included three demographic variables: gender (gender), years of farming experience (years farming), and highest education level (education). The response options for the education level were 1=some high school or less, 2=high school diploma or GED, 3=some college or associate degree, 4=bachelor’s degree, 5=graduate or professional degree. We attempted to add farmers’ age as an additional control variable, but its high correlation with years of farming experience ($r=0.86$, $p<0.001$) would lead to a multicollinearity issue. Nonetheless, we report descriptive statistics for age in the Results section.

**3.3 Analytical approach**

**Regression models**

To test our hypotheses, we employed General Linear Models (GLM). Model 1 examined how farmers’ attitudes toward China were affected by (1) mass media, (2) interpersonal communication, (3) interpersonal communication credibility, and (4) media credibility. The following farm and demographic variables served as control variables: (5) farm size, (6) farm income, (7) gender, (8) years farming, and (9) education. Model 2 examined how farmers’ attitudes toward the trade dispute were affected by (1) attitudes toward China, (2) knowledge, (3) interpersonal communication, (4) mass media, (5) interpersonal credibility, (6) media credibility, and (7) risk taking. The same control variables were added to Model 2. They are (8) farm size, (9) farm income, (10) gender, (11) years farming, and (12) education.

**Mediation analysis**

Based on the significant direct effects captured by the regression models, we then followed Holmbeck’s (2002) suggestion to conduct a post-hoc mediation effect analysis on media credibility to find out if it mediates the relationship between attitudes toward China and attitudes toward the trade dispute. We used Hayes’ PROCESS macro to do the mediation effect analysis (Hayes, 2017).

**4. Results**

**4.1 Sample characteristics**

Of the 693 farmers who returned usable questionnaires, 96.3% were male, with ages ranging from 25 to 88 (mean=60.7; SD=10.92). On average, respondents had 38.5 years of farming experience (SD=12.33). The average farm size was 1000 acres; median annual gross farm income was $375,000. Most (71.4%) had some college education. These characteristics suggest that our sample represents mid-size and large-scale family and commercial farms (Dunckel, 2013; Economic Research Service, 2020).

**4.2 Unfavorable attitudes toward China and somewhat pessimistic attitudes toward the trade dispute**

Table 1 presents each attitude item’s descriptive statistics, PCA factor loadings, and Cronbach alpha scores. The PCA resulted in a two-factor solution (KMO=0.89; Bartlett’s test of sphericity; $p<0.001$) with all factor loadings above 0.40, which indicates good validity of the two attitudinal factors (Costello and Osborne, 2005). With Cronbach’s $\alpha \geq 0.7$, each set of items reliably measures the two attitudes.
Table 1. Midwest farmers’ attitudes toward China and the U.S.–China trade dispute.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Statement</th>
<th>Agree or strongly agree</th>
<th>Mean</th>
<th>SD</th>
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<th>Factor loading</th>
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<td></td>
<td></td>
<td>77.8% 3.97 0.81 680 0.43</td>
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<tr>
<td>Attitude toward China (Cronbach’s ( \alpha = 0.70 ))</td>
<td>The amount of U.S. debt held by China is a serious problem for the U.S.</td>
<td>76.0% 4.05 0.78 676 0.71</td>
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<td>China’s record of enforcing intellectual property rights leaves much to be desired.</td>
<td>72.4% 3.77 0.96 678 0.50</td>
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<td>The trade deficit with China is harmful to the U.S. economy.</td>
<td>70.9% 3.95 0.84 678 0.69</td>
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<td>China engages in cyber economic espionage against the U.S.</td>
<td>63.9% 3.67 0.89 676 0.57</td>
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<td>The number of jobs Americans lose to China is problematic.</td>
<td>58.9% 3.69 0.75 676 0.68</td>
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<td>The Chinese government exerts too much influence on the value of its currency.</td>
<td>47.0% 3.52 0.78 675 0.60</td>
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<tr>
<td>Attitudes toward the trade dispute (Cronbach’s ( \alpha = 0.93 ))</td>
<td>American farmers will bear the brunt of the tariffs imposed by the Chinese government.</td>
<td>75.9% 2.02 1.01 680 0.67</td>
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<td>The trade disruption will make U.S. agriculture lose markets to our competitors.</td>
<td>62.4% 2.34 1.19 681 0.83</td>
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<td>The tariffs imposed by the U.S. and China on each other’s products will have long-term negative effects on U.S. agriculture.</td>
<td>47.3% 2.68 1.20 678 0.77</td>
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<td>Three years from now, the U.S. economy, in general, will be better off because of the trade dispute.</td>
<td>44.3% 3.14 1.18 679 0.83</td>
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<td>The trade disruption will enhance the economic relationship between the U.S. and China in the long run.</td>
<td>36.6% 2.94 1.13 679 0.79</td>
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<td>The U.S. economy will suffer more than China’s due to this trade dispute.</td>
<td>36.3% 3.01 1.23 679 0.76</td>
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<td></td>
<td>Nothing good will come out of this trade dispute.</td>
<td>29.9% 3.28 1.28 679 0.85</td>
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<td>A year from now, U.S. agriculture will be better off compared to now because of this trade dispute.</td>
<td>20.1% 2.51 1.10 675 0.88</td>
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<td></td>
<td>A year from now, my farm operation will be better off financially because of this trade dispute.</td>
<td>13.9% 2.37 1.07 674 0.84</td>
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</table>

Scale: 1, strongly disagree; 2, disagree; 3, neither agree nor disagree; 4, agree; 5, strongly agree.

\( ^{a} \) Items were reverse-coded to calculate means and conduct factor analysis.
Based on the indexed variable’s statistics (mean=3.80, SD=0.50), farmers reported unfavorable overall attitudes toward China. Most (>70%) agreed or strongly agreed that the U.S. debt held by China is a serious problem, that the trade deficit with China is harmful, that China engages in cyber economic espionage, and that China improperly enforces intellectual property rights. A majority (>50%) agreed or strongly agreed that Americans lose jobs to China and find this problematic, and that the Chinese government exerts too much influence on its currency value. Slightly less than half (47%) agreed or strongly agreed that China often gets into territorial disputes with other countries.

Overall, farmers had somewhat pessimistic attitudes about the trade dispute based on the indexed variable’s descriptive statistics (mean=2.72, SD=0.93). Specifically, less than 14% believed their farm operation will be better off financially in a year, only about 20% thought U.S. agriculture will be stronger because of this trade dispute, and slightly more than 40% believed the dispute will benefit the U.S. economy as a whole three years hence, and less than 40% thought the trade dispute will enhance the economic relationship between the two countries in the long run. At the same time, the majority of farmers (>60%) agreed or strongly agreed that U.S. agriculture will lose markets to competitors, and American farmers will bear the brunt of the Chinese tariffs. These results reflect the respondents’ pessimistic attitudes about the outcomes of the trade dispute although more than half did not agree that “nothing good will come out of this trade dispute,” “the U.S. economy will suffer more than that of China,” and “the tariffs will have long-term negative effects on U.S. agriculture.”

4.3 Intermediate knowledge level about the trade dispute

On average, farmers correctly answered two out of three questions (mean=2.31, SD=0.57) in the knowledge quiz. Only 4.1% failed to offer any correct answer, 25.5% answered one question correctly, 47.2% gave correct answers to two questions, and 23.1% answered all three questions correctly. Most (90.3%) correctly recalled the 2018 market facilitation payment made by the federal government; a majority (63.8%) knew the percent of tariff China imposed on U.S. soybean exports in July 2018; and about one-third (34.8%) were aware of the percentage of U.S. soybean exports shipped to China in 2017. As expected, farmers were more knowledgeable about direct subsidies to their farms than trade figures at the national level. In general, farmers’ knowledge of the basic facts about the trade dispute can be considered at the intermediate level.

4.4 Infrequent information seeking

Table 2 shows the sources farmers used to get information about the trade dispute. Farmers’ groups and organizations (mean=3.20) were the leading interpersonal sources used, followed by family, friends, or neighbors (mean=2.75), university sources (mean=2.57), and government agencies or officials (mean=2.57). In terms of mass media sources, farmers reportedly used TV (mean=3.11) and radio (mean=3.19) the most. Social media (mean=2.01), online newspapers (mean=2.25), and online magazines (mean=2.02), were less frequently used. The results of a t-test showed that farmers significantly relied more on interpersonal (mean=2.79, SD=0.76) than mass media sources (mean=2.65, SD=0.71) for information, t(678)=5.47, p<0.001; Cohen’s d=0.21. Overall, however, farmers did not seek information frequently from any of these sources.

4.5 Average credibility ratings of interpersonal and mass media sources

Table 3 lists how farmers perceived the credibility of each information source. Among interpersonal sources, farmers’ groups and organizations (mean=3.40) and university sources (mean=3.30) received relatively higher ratings compared to government agencies or officials (mean=2.89) and family, friends, or neighbors (mean=2.74). The credibility of radio (mean=3.08) and printed magazines (mean=3.02) were rated higher than other mass media sources. Social media credibility was rated the lowest (mean=2.21). Generally, farmers rated the credibility of interpersonal sources slightly above average (mean=3.09, SD=0.69) and evaluated
Table 2. Frequency of seeking information about the trade dispute from interpersonal and mass media sources.

<table>
<thead>
<tr>
<th>Type</th>
<th>Source</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal communication</td>
<td>Farmers’ groups and organizations</td>
<td>3.20</td>
<td>1.02</td>
<td>673</td>
</tr>
<tr>
<td>(Cronbach’s α= 0.73)</td>
<td>University sources</td>
<td>2.57</td>
<td>1.03</td>
<td>667</td>
</tr>
<tr>
<td></td>
<td>Government agencies or officials</td>
<td>2.57</td>
<td>1.01</td>
<td>667</td>
</tr>
<tr>
<td></td>
<td>Family, friends, or neighbors</td>
<td>2.75</td>
<td>0.98</td>
<td>673</td>
</tr>
<tr>
<td>Mass media (Cronbach’s α= 0.70)</td>
<td>TV news</td>
<td>3.11</td>
<td>1.10</td>
<td>680</td>
</tr>
<tr>
<td></td>
<td>Radio</td>
<td>3.19</td>
<td>1.05</td>
<td>679</td>
</tr>
<tr>
<td></td>
<td>Printed newspapers</td>
<td>2.83</td>
<td>1.14</td>
<td>666</td>
</tr>
<tr>
<td></td>
<td>Online newspapers</td>
<td>2.25</td>
<td>1.21</td>
<td>660</td>
</tr>
<tr>
<td></td>
<td>Printed magazines</td>
<td>2.98</td>
<td>1.05</td>
<td>674</td>
</tr>
<tr>
<td></td>
<td>Online magazines</td>
<td>2.02</td>
<td>1.12</td>
<td>657</td>
</tr>
<tr>
<td></td>
<td>Social media</td>
<td>2.01</td>
<td>1.17</td>
<td>660</td>
</tr>
</tbody>
</table>

Scale: 1, never; 2, rarely; 3, sometimes; 4, often; 5, all the time.

Table 3. Perceived credibility of information sources about the trade dispute.

<table>
<thead>
<tr>
<th>Type</th>
<th>Source</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal credibility (Cronbach’s α= 0.74)</td>
<td>Farmers’ groups and organizations</td>
<td>3.40</td>
<td>0.90</td>
<td>626</td>
</tr>
<tr>
<td></td>
<td>University sources</td>
<td>3.30</td>
<td>0.90</td>
<td>570</td>
</tr>
<tr>
<td></td>
<td>Government agencies or officials</td>
<td>2.89</td>
<td>0.89</td>
<td>586</td>
</tr>
<tr>
<td></td>
<td>Family, friends, or neighbors</td>
<td>2.74</td>
<td>0.85</td>
<td>613</td>
</tr>
<tr>
<td>Media credibility (Cronbach’s α= 0.88)</td>
<td>TV news</td>
<td>2.69</td>
<td>1.05</td>
<td>480</td>
</tr>
<tr>
<td></td>
<td>Radio</td>
<td>3.08</td>
<td>0.91</td>
<td>639</td>
</tr>
<tr>
<td></td>
<td>Printed newspapers</td>
<td>2.86</td>
<td>0.94</td>
<td>602</td>
</tr>
<tr>
<td></td>
<td>Online newspapers</td>
<td>2.59</td>
<td>0.91</td>
<td>462</td>
</tr>
<tr>
<td></td>
<td>Printed magazines</td>
<td>3.02</td>
<td>0.86</td>
<td>583</td>
</tr>
<tr>
<td></td>
<td>Online magazines</td>
<td>2.70</td>
<td>0.90</td>
<td>436</td>
</tr>
<tr>
<td></td>
<td>Social media</td>
<td>2.21</td>
<td>0.94</td>
<td>432</td>
</tr>
</tbody>
</table>

Scale: 1, very poor; 2, poor; 3, average; 4, high; 5, very high.

the credibility of mass media sources slightly below average (mean=2.82, SD=0.76). Comparing the indexed variables, we noted that the credibility ratings of interpersonal sources were significantly higher than those of mass media sources, t(657)=9.62, p<0.001; Cohen’s d=0.38.

4.6 Moderate risk propensity

The indexed risk propensity variable’s average was 4.53 (SD = 1.21) on a seven-point Likert scale. This indicates that in general, our respondents were moderately inclined to take risks. Specifically, the average rating on general willingness to take risk was 4.48 (SD=1.27); the average rating on willingness to take risk as a farmer was 4.59 (SD=1.28). The two items were found to be reliable (Cronbach’s α= 0.89).

4.7 Model 1: Attitudes toward China

Table 4 reports the regression results for Model 1. Although the model explains only 4% of the variance in farmers’ attitudes toward China, it is significant ($F$ (9, 551)=2.63, $p=0.006$). We did not find support for H3a ($\beta$=-0.03, $p > 0.05$) nor for H4a ($\beta$=0.08, $p > 0.05$), suggesting that farmers’ information-seeking from any source did not significantly influence their attitudes toward China. However, we found evidence to support
H5a in that perceived credibility of interpersonal sources positively associated with unfavorable attitudes toward China ($\beta=0.18$, $p<0.01$). We also accepted H6a because we found a negative association between farmers’ perceived credibility of mass media sources and farmers’ unfavorable attitudes toward China ($\beta=-0.17$, $p<0.01$). All control variables in the model did not have significant effects on farmers’ attitudes toward China.

### 4.8 Model 2: Attitudes toward the trade dispute

Table 5 reports the regression results for Model 1. The overall regression model significantly explained farmers’ overall attitudes toward the trade dispute ($F(12, 506)=10.14$, $p<0.001$), accounting for 19% of the variance in the dependent variable ($R^2=0.19$). Consistent with H1, we found farmers’ (unfavorable) attitudes toward China to be positively associated with attitudes toward the trade dispute ($\beta=0.19$, $p<0.001$). However, we did not find support for H2, finding that knowledge level had no significant effect on attitudes toward the trade dispute ($\beta=-0.01$, $p=0.766$). Additionally, because farmers’ use of interpersonal sources was positively associated with attitudes toward the trade dispute and because this relationship was statistically significant ($\beta=-0.11$, $p<0.05$), we find evidence to support H3b. Contrary to H4b, we found a negative association between mass media use and the dependent variable ($\beta=-0.11$, $p<0.05$) rather than the anticipated positive effect. Thus, we fail to accept H4b. We did not find support for H5b because the results showed no significant association between the perceived credibility of interpersonal sources and attitudes toward the trade dispute ($\beta=-0.03$, $p>0.05$). However, the results lend support to H6b, which posed a negative relationship between the perceived credibility of media sources and attitudes toward the dispute ($\beta=-0.30$, $p<0.001$). Consistent with H7, farmers’ willingness to take risks was positively associated with attitudes toward the trade dispute ($\beta=-0.10$, $p<0.05$). Aside from the main explanatory variables covered by the seven hypotheses, the results also show that gross farm income ($\beta=-0.11$, $p<0.05$) and years of farming ($\beta=-0.14$, $p<0.01$) are negatively associated with farmers’ attitudes toward the trade dispute. This indicates that more affluent farmers held more negative attitudes about the trade dispute, so did those who have had more farming experience.

### 4.9 Model 3: Mediation effect

Figure 2 summarizes the results of two regression models and the hypothesis tests. As it shows, media credibility has a significant effect on attitudes toward China, attitudes toward China has a significant effect on attitudes toward the trade dispute, and media credibility also has a significant effect on attitudes toward the trade dispute. According to Holmbeck (2002), the three significant effects create a necessary condition to examine a mediation effect of the mediator variable (attitudes toward China) between the independent variable (media credibility) and the dependent variable (attitudes toward the trade dispute). We thus proceeded with the mediation effect analysis using Hayes’ PROCESS macro (Hayes, 2017).
Table 5. Results of regression analysis for Model 2: Attitudes toward the trade dispute.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Standardized coefficient (β)</th>
<th>Standard error</th>
<th>p-value</th>
<th>Hypothesis test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes toward China</td>
<td>0.19**</td>
<td>0.074</td>
<td>&lt;0.001</td>
<td>H1: Accepted</td>
</tr>
<tr>
<td>Knowledge</td>
<td>-0.01</td>
<td>0.047</td>
<td>0.766</td>
<td>H2: Rejected</td>
</tr>
<tr>
<td>Interpersonal communication</td>
<td>0.11*</td>
<td>0.068</td>
<td>0.046</td>
<td>H3b: Accepted</td>
</tr>
<tr>
<td>Mass media</td>
<td>-0.11*</td>
<td>0.070</td>
<td>0.048</td>
<td>H4b: Rejected</td>
</tr>
<tr>
<td>Interpersonal credibility</td>
<td>-0.03</td>
<td>0.070</td>
<td>0.584</td>
<td>H5b: Rejected</td>
</tr>
<tr>
<td>Media credibility</td>
<td>-0.30**</td>
<td>0.062</td>
<td>&lt;0.001</td>
<td>H6b: Accepted</td>
</tr>
<tr>
<td>Risk</td>
<td>0.10*</td>
<td>0.033</td>
<td>0.021</td>
<td>H7: Accepted</td>
</tr>
<tr>
<td>Farm size</td>
<td>0.04</td>
<td>0.000</td>
<td>0.383</td>
<td>-</td>
</tr>
<tr>
<td>Farm income</td>
<td>-0.11*</td>
<td>0.000</td>
<td>0.028</td>
<td>-</td>
</tr>
<tr>
<td>Gender</td>
<td>0.06</td>
<td>0.199</td>
<td>0.142</td>
<td>-</td>
</tr>
<tr>
<td>Years farming</td>
<td>-0.14**</td>
<td>0.003</td>
<td>0.001</td>
<td>-</td>
</tr>
<tr>
<td>Education</td>
<td>-0.028</td>
<td>0.043</td>
<td>0.504</td>
<td>-</td>
</tr>
</tbody>
</table>

$F(12, 506) = 10.14, \ p < 0.001; R^2 = 0.19; *p < 0.05; **p < 0.01.$

![Diagram](image-url)

**Figure 2.** Tested framework and hypotheses.

Table 6 shows the coefficients of the mediation model. The perceived credibility of mass media sources had negative effects on both farmers’ (unfavorable) attitudes toward China and their attitudes toward the trade dispute. Farmers’ (unfavorable) attitudes toward China had a positive effect on their attitudes toward the trade dispute.

Table 7 presents the direct effect, indirect effect, and total effect of the mediation model. From the table, we find that in addition to the significant direct effect ($b=-0.370; \beta=-0.30; p<0.001$), farmers’ perceived credibility
of mass media sources had a significant indirect effect \( (b=-0.037; \beta=-0.03; p<0.001) \) on attitudes toward the trade dispute. The total effect of perceived media credibility on farmers’ attitudes toward the trade dispute was also significant \( (b=-0.407; \beta=0.33; p<0.001) \). This model demonstrates complementary mediation because both direct and indirect effects were significant and point toward the same direction (Zhao et al., 2010).

### 5. Discussion and implications

#### 5.1 Understanding farmers’ attitudes

We observed that farmers’ attitudes toward China were generally unfavorable, a finding that is consistent with the results of Pew public opinion polls over the past 14 years (Silver et al., 2019). In general, farmers agreed that China runs roughshod on U.S. intellectual property rights, engages in cyber espionage, and exerts too much influence on its currency. Farmers were also concerned about the huge American debt held by China, the trade deficit with China, and the loss of American jobs to China. These concerns also have been expressed by Americans in general (Devlin et al., 2020; Silver, 2022; Wike and Devlin, 2018). However, compared with the severity of the general American public’s concerns, Midwest farmers saw China in a more favorable light. This may be because farmers recognize this country as a longstanding major and stable importer of soybeans and other agricultural commodities (Bandyopadhyay et al., 2018). This finding suggests that the strength of negative attitudes varies by subgroups of the population.

Farmers’ unfavorable attitudes toward China did not always elicit optimistic attitudes toward the trade dispute although we found a significant association between these two variables. In general, our farmer-respondents were somewhat pessimistic about the outcomes of the trade war, likely brought about by the realization that the farm sector was likely to be a major casualty of the trade standoff. Indeed, farmers suffered huge financial losses because they were deprived of a large market. Despite economic travails, farmers were slightly optimistic that the trade dispute will produce benefits in the long run.

Our findings suggest that farmers are acutely aware of their long-standing role as major suppliers of food commodities to the world and that they appreciate China’s importance as a key trade partner. These

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**Table 6.** Coefficients of the mediation model from media credibility to attitudes toward the trade dispute through attitudes toward China.

<table>
<thead>
<tr>
<th>Path</th>
<th>Unstandardized coefficient ((b))</th>
<th>Standardized coefficient ((\beta))</th>
<th>Standard error</th>
<th>(p)-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media credibility-&gt; Attitudes toward China</td>
<td>-0.112**</td>
<td>-0.17**</td>
<td>0.036</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Attitudes toward China -&gt; Attitudes toward the trade dispute</td>
<td>0.335**</td>
<td>0.19**</td>
<td>0.074</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Media credibility-&gt; Attitudes toward the trade dispute</td>
<td>-0.370**</td>
<td>-0.30**</td>
<td>0.062</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

\*\(p<0.05; \quad \text{**} p<0.01.\)

**Table 7.** Direct and indirect effects of media credibility on attitudes toward the trade dispute.

<table>
<thead>
<tr>
<th>Effect type</th>
<th>Unstandardized effect size ((b))</th>
<th>Standardized effect size ((\beta))</th>
<th>Standard error</th>
<th>(p)-value</th>
<th>Bootstrapped confidential interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct effect</td>
<td>-0.370**</td>
<td>-0.30**</td>
<td>0.062</td>
<td>&lt;0.001</td>
<td>[−0.491, −0.249]</td>
</tr>
<tr>
<td>Indirect effect</td>
<td>-0.037**</td>
<td>-0.03**</td>
<td>0.017</td>
<td>&lt;0.001</td>
<td>[−0.076, −0.009]</td>
</tr>
<tr>
<td>Total effect</td>
<td>-0.407**</td>
<td>-0.33**</td>
<td>0.062</td>
<td>&lt;0.001</td>
<td>[−0.530, −0.285]</td>
</tr>
</tbody>
</table>

Bootstrap \(n=5000. \quad \text{*}p<0.05; \quad \text{**} p<0.01.\)
considerations seemingly override their negative predisposition toward China. In farmers’ cognitive framework, negative attitudes toward China and economic rationality seemingly combined to produce mixed sentiments. While many accepted the pain of retaliatory tariffs in the belief that Beijing would be forced to alter its trade practices, many were also skeptical of victory, believing that the trade war will not be resolved in a way that benefits U.S. agriculture. This suggests the need to be more mindful of the impact of trade policies on food producers. Understanding what is important to them will not only facilitate speedy impact analysis once the details of trade policy decisions are known but, equally important, may inform the negotiating process.

5.2 Understanding the determinants

We did not find a significant influence of knowledge level on attitudes, which echoes the findings of other scholars (e.g., Brossard et al., 2005; Kelly and Barker, 2016). This may be because we measured objective knowledge about trade-related figures, and not necessarily farmers’ cognitions of the multi-faceted trade dispute, its semantics, and how they think it affects their livelihood (Gould and Woodbridge, 1998). As Fabrigar et al. (2006) recommend, the potential contributions of knowledge can best be ascertained by employing a multi-dimensional scale.

Farmers saw themselves as moderate risk-takers, and risk-taking, we found, was a significant predictor of farmers’ attitudes toward the trade dispute. Those more willing to take risks showed more favorable dispositions toward the trade disagreement. This finding suggests that farmers with a greater propensity to take risks were more confident about the outcomes of the trade dispute, expecting that short-term pain will eventually bring long-term benefits. This finding is consistent with those of other scholars (e.g., Kahan, 2013; Rogers, 2003) who argue that risk-takers tend to be more adaptive to change.

Although farmers referred to interpersonal and mass media sources to stay informed about the trade standoff, they did not do so frequently or on a regular basis. Our findings indicate that information seeking from any source, interpersonal or otherwise, did not have a bearing on farmers’ attitudes toward China. This suggests that the influence of information sources may be overridden by farmers’ inherently negative attitudes toward China (Gries et al., 2010).

Do mass media channels and interpersonal sources differ with respect to their impact on attitudes toward the dispute? Our findings indicate that different channels influence attitudes differently. Farmers who used interpersonal sources more frequently were more likely to hold positive attitudes toward the trade dispute. Contrary to our expectation, using mass media sources negatively affected farmers’ attitudes towards the trade dispute. This finding highlights the need for quality reporting on complex and multi-faceted trade issues. A more nuanced media coverage can better inform farmers about agricultural trade policy and thus help them make adaptive decisions. The result also points to the need to be strategic in selecting communication channels to explain trade-related issues to farming constituencies, suggesting that there is fertile ground for the future exploration of how different communication channels affect farmers’ attitudes and behavior. For instance, researchers can delve deeply into how various information sources mirror and represent social and personal ideologies likely to be on display in most tariff showdowns.

What sources did our respondents find to be credible? Overall, interpersonal sources were rated more credible than the mass media. Among a roster of interpersonal sources, farmers tended to put more trust on farmers’ groups and organizations, and universities. Among mass media sources, radio and printed magazines were viewed to be most credible. The perceived credibility of these sources also influenced attitudes toward China and the trade dispute differently. The degree to which farmers perceived the credibility of interpersonal sources reinforced farmers’ unfavorable attitudes toward China, but had no effect on attitudes toward the trade dispute. In addition, perceived media credibility weakened unfavorable attitudes toward China. Although American media often depict a disapproving portrayal of China, which ignores the benefits both countries accrue from longstanding partnerships (Ha et al., 2020), farmers may bring into play their knowledge of
the intricacies of the trade squabble with China when they evaluate the credibility of information sources. It stands to reason that credible sources are those seen to be fair and balanced in their reporting of issues and events, which have the effect of toning down negative attitudes. While we observed that perceived media credibility weakened unfavorable attitudes with respect to China, media credibility appears to strengthen unfavorable attitudes toward the trade dispute. This finding hints at the growing realization among farmers that they are paying a steep price as they lose almost two-thirds of their exports. Expert and trustworthy media reporting may have provided evidence that the trade war is costing them the Chinese market, which they worry may be difficult to recover. The total effect of media credibility outweighed all other explanatory variables in the mediation model that sought to unravel attitudes toward the trade dispute. Our results confirm the importance of perceived media credibility on attitudes, suggesting the need for high-quality coverage that will help farming audiences make appropriate choices, especially in times of tit-for-tat tariffs and bellicose rhetoric. One can therefore conceive of media credibility as the doorway to attitude change.

Farmers’ attitudes toward the trade dispute were found to be associated with years of experience as a producer and gross farm income. Farming experience had a negative influence on attitudes toward the trade war. This supports Maddison’s (2006) observation that farmers with considerable experience are more perceptive and sensitive to the risks posed by uncertainties and will, therefore, be less supportive of hardline trade policies. More experienced farmers may see the present trade dispute as having the same devastating effects as the grain embargo against the Soviet Union that President Carter put into effect in response to the Soviet Union’s invasion of Afghanistan in 1979 (Plates, 2019).

Another farming characteristic, gross farm income, also negatively influenced farmers’ attitudes toward the trade dispute. The United States Department of Agriculture (USDA) uses gross farm income to establish a typology that classifies farms into small, mid-size, and large-scale operations. The U.S. grain production system has been built for large exports with a goal of “feeding the world” (Schechinger and Cox, 2016), but large-scale operations stand to lose more in the absence of stable markets for the high volumes of commodities they produce. By the time we closed data collection, farmers have already received their initial market facilitation payment, which was followed by three additional rounds of payment in 2019. Since payments were based on historical profitability or farm size (USDA, 2020), large-scale farms should have been paid more. Thus, the effect of gross farm income is likely to change as farmers receive additional payments. Follow-up studies are thus needed to track those changes.

6. Conclusions and limitations

This study provided a better understanding on how American Midwest farmers viewed the U.S.–China trade dispute and their attitudes toward China. This present study uncovered American Midwest farmers’ unfavorable attitudes toward China and their somewhat pessimistic attitudes toward the trade dispute. We identified multiple factors that significantly influenced these attitudes such as information sources, the perceived creditability of these sources, risk propensity, farm income, and years of farming experience. We further identified a complementary mediation effect of attitudes toward China on the relationship between perceived media credibility and farmers’ attitudes toward the trade dispute. However, the findings of the study should be viewed with caution. We measured farmers’ attitudes before the signing of the first phase of the U.S.–China trade deal, a tentative agreement to ease the tensions, in January 2020. We surmise that attitudes are likely to change as China progressively fulfills its trade commitments, including the purchase of agricultural goods worth $32 billion (Bisio et al., 2020). These anticipated shifts in attitudes demand a time series analysis.

Moreover, ours is mainly an exploratory study. We surveyed only farmers with at least 250 acres of farm operation in three Midwest states. The selection criteria inevitably exclude small-scale farms from our sample, potentially resulting in sampling bias. Strictly speaking, the conclusions cannot be generalized beyond the study population. However, our results imply that farmers with large- or medium-size farms...
may have similar characteristics and attitudes as our sample, although additional research efforts are still needed using a more representative sample. Our results also suggest that further research could inform the creation of balanced and reciprocal policies and structures that realistically consider the impact of trade disagreements on a country’s food and agriculture complex. Different research methods (e.g., qualitative research and case studies) can also contribute to a more realistic consideration of the interests of both sides in any trade dispute, which would yield progress in resolving conflicts in a manner consistent with sustaining the livelihood of farmers and keeping the world economy open for healthy business.

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