

## Article

# Understanding the Importance of International Quality Standards Regarding Global Trade in Food and Agricultural Products: Analysis of the German Media

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**Abstract:** Rapid globalization of the agrifood industry has important impacts on international trade and quality management (QM). Likewise, the European Union has negotiated a series of bilateral free trade agreements. Of note was the Transatlantic Trade and Investment Partnership (TTIP) with the United States of America, where the debate focused on the mutual recognition and harmonization of quality standards, especially for agricultural and food products. This topic offered the mainstream media excellent substances for coverage. This paper explores German print media, television, and radio on the importance of international quality standards in the agrifood sectors in light of the TTIP. A quantitative and qualitative empirical content analysis was performed to investigate media reporting regarding (a) its scientific character, (b) the use of the term “quality standards” of the agrifood industry, and (c) the reporting on the agrifood industry and QM linked with TTIP, focused on harmonization. The results showed that interrelations between QM and global trade were not presented to recipients in-depth. A trend toward information asymmetries in recipient’s knowledge is indicated. The study addresses recommendations for future collaborations between media, policy-makers, and further cooperation in the mutual recognition and harmonization of quality standards and control procedures within global trade.

**Keywords:** quality standards; quality management; food safety; free trade agreement; global trade; agrifood sector; transatlantic trade; transatlantic trade and investment partnership



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## 1. Introduction

In the European Union (EU), several regulations on food safety and quality management (QM) in the agrifood sector apply to all Member States. In 2002, the EU substantially revised food legislation and set its main objectives. These are the protection of public health, plant health, and animal health with the observance of animal welfare, protection against fraud, and proper information; see Article 5, General Food Law (Regulation (EC) No 178/2002) [1]. The EU’s main objective is, therefore, to apply, promote, maintain, and defend these principles of high food safety standards [2].

The rapid globalization of the agrifood industry has important impacts on international trade and QM. To foster fair world trade, the EU has been negotiating so-called second-generation free trade agreements (FTAs) bilaterally with other states for several years [3,4]. In the negotiations, the topic of harmonizing standards—as well as the agrifood sector—came up on the agenda regularly. The Transatlantic Trade and Investment Partnership (TTIP) between the EU and the United States of America (US), which has been negotiated since June 2013, is a leading example [5]. After 15 rounds of negotiations and the election of the 45th US President, Donald Trump, the activities were paused in 2017 [6] and declared obsolete in April 2019 [7]. On 25 July 2018, the two partners launched a new phase

of the Transatlantic Partnership [8] and agreed on a joint declaration. With this, they agreed to completely eliminate tariffs, non-tariff barriers to trade, and subventions. They also agreed on a close dialogue on standards to facilitate trade [9]. Consequently, on 18 January 2019, the European Commission (EC) presented the first drafts of negotiation mandates [10] and the US announced their negotiating objectives for a trade agreement [11]. With the election of the 46th US President, Joe Biden, on 20 January 2021, much optimism has been expressed by the EU side and in Germany that the new administration will inject new impetus into transatlantic trade relations [12–15]. This is a clear sign that trade relations between the two partners are gaining momentum and the mainstream media will once again report on the negotiations, with the aim of improving recipient's knowledge.

This study provides an overview and contributes to existing knowledge surrounding media coverage of FTAs for quality managers and political decision-makers, as well as the media competence (see Table S2) of recipients. Given today's globalized markets, it will be of great significance to understand the influencing mechanisms of media reporting on recipient's knowledge and acceptance. With this knowledge, policy-makers could adjust free trade developments and transparency, and the agrifood industry could further improve product quality and quality standards that require a high level of safety. The retrospective media analysis is therefore of enormous strategic value. For the democratic decision-making of recipient's, the mandate of the media is to report neutrally and comprehensively on contemporary events. Thus, it is worth reviewing and analyzing media coverage during the TTIP negotiations since 2013 on the crucial issue of mutual recognition and harmonization of quality standards in the agrifood sector (AFQ Standards). It is well known that mainstream media have a multiplier function, acting as information providers and opinion influencers [16,17]. The present study centered on the regulations of the European General Food Law, international DIN EN ISO standards, and private standards. The principle of providing proper information to the public is anchored in the EU's General Food Law [1]. Therefore, it was investigated whether the German public media and other selected mainstream media followed this principle in their reporting.

Germany is the US's third most important EU trading partner [18]; therefore, this study focuses primarily on the analysis of German print media and electronic media. The applied research method was an empirical content analysis (ECA), which was combined with a guideline analysis for quantitative and qualitative evaluation [19].

## 2. Literature Review

Since the beginning of TTIP negotiations, there has been intensive media discussion about the possible effects of the FTA on European consumer protection standards and the EU's food quality policy, as the two partners pursue fundamentally different approaches in practice. Although the EU has always emphasized that none of the existing EU standards in the agrifood sectors will be lowered in line with US regulations and thus no compromises will be made, a public controversy has arisen.

As Matthews (2016) [20] recognized, several disputes regarding food safety standards, notably the sanitary and phytosanitary measures (SPS), were the focus of public debate. He noted that the discussion of the potential impact of a possible FTA between the US and the EU on EU's food standards had attracted a high degree of attention and immense distrust among the public. For instance, Matthews (2016) [20] mentioned the EU import bans of hormone-treated US beef and pork treated with growth-promoting additives. The typical US treatment of poultry washed with antimicrobial rinses to reduce the number of pathogens was specifically highlighted [20,21].

Following the TTIP negotiations, the media also reported on the use of genetically modified organisms (GMOs), as both partners have different standards in this field. Vignani and Olper (2013) [22] have confirmed, by utilizing a composite index on GMO regulatory restrictiveness, that the US, a GMO user, is polarizing compared to the EU, a non-user. Regarding the role of the media, the same empirical study found that reporting on food safety issues is skewed toward predominantly negative headlines. This implied that

the media play a fundamental role in determining the stringency of GMO standards, as their reports create stricter GMO standards and other political distortions [22]. Further, it was identified that the majority of the population is uninformed about the GMOs but is nevertheless vehemently opposed to their use and has a negative attitude toward their use [23–26]. Opponents of GMOs used this attitude in all media platforms to anchor the risks of GMOs in people’s minds by “creating images that spring from the imagination”.

Public information on food safety issues is generally considered problematic [27], because it is more frequent and widespread than it has been traditionally, thus increasing public awareness of the risks. Therefore, the provision of proper facts plays a special role in media coverage. Moreover, the agrifood industry has evolved from national to international in scope, meaning that food safety concerns must be placed in a global context. As such, mainstream media provide a platform for shifting public discourse and influences the political agenda concerning global food safety topics.

As the issues of food safety and agriculture have drawn the attention of the public and the media, several research projects with references to global trade were conducted to examine the interaction between media coverage and agriculture [26,28–30], food safety [26,27,31–34], and related consumer behavior [4,35–40].

Two revealing papers addressed the assessment of the media’s coverage of the TTIP: Conrad (2018) [41] provided insight into the EU’s image in US newspapers during TTIP negotiations. The Irish media were investigated by Finnegan (2018) [42] for coverage of the TTIP and the Comprehensive Economic and Trade Agreement (CETA) between the EU and Canada. The aim of the study was to investigate the media reporting about AFQ standards during the preparatory phase of the TTIP-FTA, which is of importance for the understanding of the international quality standards regarding global trade in food and agricultural products.

### 3. Methodology and Data Collection

#### 3.1. Design of the Media Analysis

A widespread method suitable for media analysis is ECA [43]. It is used for the logical-systematic, intersubjectively comprehensible description of content, and formal characteristics [44,45]. Systematic, in this context, means that each analysis is based on an individual category scheme that provides the analyst with precise work instructions [43].

This study aims to examine the motives and attitudes of journalists and their impact on the recipient, thus revealing trends in reporting on the scope of agrifood industry issues related to TTIP negotiations, as well as the temporal evolution of coverage of the defined thematic.

The key techniques of the applied ECA were frequency, valence, intensity, and contingency analyses. In this investigation, quantitative and qualitative ECA was performed. For quantitative data analysis, a category scheme with sample code sheets and coding guidelines was developed [43].

To supplement the ECA, guidelines for qualitative data analysis were designed [44]. The questions in the guidelines were derived from the hypotheses that were formulated. For verification, the media content compiled was analyzed descriptively.

The analysis period was set from the start of TTIP negotiations in June 2013 to December 31, 2016. The contributions from the media types of print, television (TV), and radio were analyzed, with only German contributions being considered. To make the content analysis procedure intersubjectively comprehensible, the analysis was grouped into four phases: planning, development, test, and application [43].

#### 3.2. Analytical Framework: Definition of Research Objectives and Hypotheses

This study is geared toward the systematic search, evaluation, and synthesis of political and research evidence on the importance of international quality standards for global trade in food and agricultural products in the context of FTAs. The following main research questions (Box 1) reflect the research interest and the topic of the analysis.

Nine sub-research questions were prepared, resulting in nine hypotheses (Table 1).

**Table 1.** Sub-research questions with the corresponding hypotheses of quantitative and qualitative media analysis.

Sub-Research Questions	Hypotheses (H)
<b>Quantitative Media Analysis</b>	
Frequency	
1. What kind of frequency does the TTIP have in print media, TV, and radio?	H1: The frequency of the TTIP in the media is high.
2. What kind of frequencies do the agrifood industry and QM issues have?	H2: The frequency of the agrifood industry and QM issues is not very pronounced.
Temporal changes in reporting	
3. Is the number of reports after certain events higher? Are there any temporal changes?	H3: After certain events, reporting is tendentiously higher.
The embodiment of the TTIP in the media in the context of the agrifood industry	
4. How is the TTIP presented in the media? Is there a discernable opinion? Which positive and negative statements are mentioned?	H4: Due to the mandate of public media, neutral reporting is expected.
Reporting on the standards and quality management of the agrifood industry linked with the TTIP	
5. In which thematic context was the TTIP discussed? Which branches were mentioned?	H5: The TTIP is often mentioned alongside the defined keywords and within certain branches, and there is an explicit connection to the sectors related to the SPS Agreement of the WTO.
6. How is the TTIP presented in connection to the standards of the agrifood industry and other QM issues? What is the state of opinion? Which standards are most commonly mentioned?	H6: A link is established with the standards of the agrifood sectors and with other QM issues. The opinion is neutral. Reporting regarding standards is vague.
<b>Qualitative Media Analysis</b>	
7. Is the reporting scientific and factual?	H7: Non-scientific reporting is expected.
8. How is the term “quality standards” used?	H8: The use of the term “quality standards” is not consistent with regard to the terminology used in QM.
9. How is the TTIP presented in linkage with the agrifood industry, the standards, and other QM issues? Is an opinion recognizable? Which positive and negative statements are mentioned?	H9: Due to the mandate of public media, neutral reporting is expected.

Source: own description.

**Box 1.** Main research questions of the media analysis.

Was there any reporting in German print media, TV, and radio about international quality standards in the agrifood sectors in the context of the Transatlantic Trade and Investment Partnership (TTIP) during the investigation period?  
Which related topics were discussed and how were they expressed and reflected?

The hypotheses were derived from general literature review but not related to a specific article. Therefore, quotes for each hypothesis are absent. Instead, by means of the literature review (Section 2), the targeted hypotheses on the research question (Box 1) were verified by the conducted media analysis experiment. The quantitative studies were based on six sub-research questions and six hypotheses (H1–H6). In the quantitative part of the study, the frequency, temporal changes in reporting, embodiment of the TTIP, and the link to the AFQ Standards were examined. Furthermore, three sub-research questions focus on qualitative aspects, for which three hypotheses (H7–H9) were defined. In the qualitative study, the reporting was assessed and the coherence with opinion formation was indicated.

### 3.3. Data Collection

By selecting the media, the investigation unit for the media analysis was defined and based on a nationally representative sample in Germany. The overviews of all selected media are available as Supplementary Materials (Table S1a–c). Only media with a high broad impact were selected, which are considered to be high-quality journalism in Germany. To obtain a representative overview of the frequency and presentation of the topic in Germany, 15 different TV programs (Table S1a) and five public radio broadcasters

(Table S1b) were analyzed. Their online media libraries were included in the analysis. Political and economic broadcasts of the categories “education” and “information” were of particular importance. The print media analysis included three news magazines, four national daily newspapers, and two national weekly newspapers. This selection, which is shown in Table S1c, reflects a comprehensive picture of print media in Germany, of which a subsample of the respective category was analyzed.

Searching for the relevant contributions, an extensive list of unambiguous phrases was created, and a trial search was launched to identify the keywords. The following keywords were defined: “chlorine-washed chicken\*”, “genetic modification (GMO)\*”, “use of hormones\*”, “hormone meat\*”, “cloning\*”, “use of pesticides\*”, “use of antibiotics\*”, “precautionary principle\*”, and “standards\*”. Wild Cards (\*) were used to expand the search and ensure that all relevant contributions could be collected. Explanations of the selected keywords are available as Supplementary Materials (Table S2). Furthermore, the contributions were scanned regarding the regulations of EU General Food Law [1], DIN EN ISO standards, and private standards. The main international standards are DIN EN ISO 22000, which specifies the requirements for a food safety management system; the DIN EN ISO 9000ff family of QM systems; and DIN EN ISO 31000, which defines the measures for risk management [46]. The following international private standards, which ensure product and process quality in the agrifood sector, were of interest in this study: IFS–International Featured Standards, BRC–British Retail Consortium Standards, FSSC22000 and QS-Standard (Qualität und Sicherheit GmbH) for quality assurance in the food industry, GLOBALG.A.P in the agricultural sector, GMP+ in the feed industry, GS1 Germany as process standard in the supply chain, and EQAsce-Standard (Education and Qualification Alliance SCE) for knowledge management and capacity building. Additionally, the international environmental and sustainability standards MSC–Marine Stewardship Council (fisheries) and ASC–Aquaculture Stewardship Council (aquaculture), as well as REDcert (biomass and agricultural raw materials), were also observed. The selection was based on Theuvsen et al. (2014) [47].

The design of a coding scheme was a major step in the ECA process because it converts the raw data into a structured form. For these media analyses, a five-level system was used whose categories were described by variables. Theoretical and empirical categories were generated, and different variables were assigned to each category. The category system was developed based on the analysis material and had to be continuously revised and adapted in the analysis process. This ECA was based not only on the keyword collection, but also mainly on the analysis through the guidelines. The guidelines contain questions about title, author names, sources, stylistic, content-related and formal means, and portrayal of TTIP (positive, neutral, or negative). The category system of the guidelines had to be extended by numerical coding instructions because variables may assume different values. In doing this, it was possible to present the complex analysis results in a reduced form. Using the category scheme and the guidelines, a pretest was conducted with a subset of the articles to be examined. The sufficient validity, objectivity, and reliability of the system could be confirmed by repeated, unsystematic random sampling examinations. The systematic approach of the analysis was ensured by the combined application of content and guideline analysis [43,44,48].

To perform the quantitative analysis, the texts, as well as TV and radio broadcasts, were scanned for certain characteristics, which were determined based on the research questions, transferred to the sample code sheet, and encoded. The formal categories were used for frequency analysis, so nominal scaling was chosen. According to their emphasis, a difference between dichotomous and polytomous attributes was made. Additionally, multiple answers to a category were possible.

Concerning the qualitative guideline analysis, an individually modified questionnaire was developed for each medium and contribution, which reflected the research questions. The guide contained the following three aspects:

- “Analysis of the media contribution regarding its scientific character”. The entire media contribution was analyzed concerning its expressiveness. The classification was made according to the criteria of whether a contribution is factual scientific or entertaining with generalized illustrations. It was examined whether the media contribution provided expertise to the recipient through relevant sources so that the recipient could form their own opinion. Thus, the principle of providing the public with proper information was examined.
- “Analysis of the use of the term ‘quality standards’ of the agrifood industry in media reporting”. The media contributions were analyzed regarding the use of the terms. The classification was based on (1) general mention, (2) explanation, and (3) misuse. Confusions and other interpretations of meaning were also recorded.
- “Analysis of the reporting on the agrifood industry and QM linked with TTIP”. The media contributions were examined concerning the dominant view on TTIP considering the main topics addressed, which concern the AFQ Standards. Three criteria were defined: favorable/positive position, opposing/negative position, and neutral position.

The selected TV shows were watched and radio programs were listened to several times until all content was documented and transferred into the questionnaire (guideline). No transcription was performed. In total, we used 31 h and 20 min of TV material ( $n = 51$ ; range 8 min to 3 h and 30 min) and 3 h and 15 min of Radio broadcasts ( $n = 34$ ; range 2 min to 23 min).

#### 3.4. Data Elaboration

The analysis was based on raw data tables (MS Excel), in which the codes of all media contributions were recorded during the analysis. No software program other than Excel Software was used. A contribution was classified as relevant if it was related to the agrifood sector and QM. For the univariate analysis of the quantitative data, the frequencies of the coded characteristic values were counted, and the nominal scale was converted into metric frequencies. Next, the relative (percentage share) and absolute (number) frequencies of characteristic expression were calculated and considered bivariate or multivariate. Dissemination analysis was used to determine the distribution of the relevant contributions to the media, as well as to the investigation period, and to identify the temporal change in the frequency of reporting [44]. The data were analyzed descriptively in tabular and graphical form. The qualitative evaluation was conducted with the contributions of the TV and radio broadcasts, though not with print media. For this, a variance analysis with target–actual comparison and a manual sentiment analysis [49,50] were used.

## 4. Results and Discussion

### 4.1. Quantitative Results: Frequency

The media response analysis revealed that between June 2013 and December 2016, a total of 1017 media reports on the TTIP appeared in print media, TV, and radio stations. The print media published 704 articles, of which 447 were relevant to the research question (63.5%), because 257 contributions were not recognized. Of the 144 TV reports, 51 (35.4%) were considered relevant and 93 were excluded. From the 169 radio broadcasts, 34 broadcasts (20.1%) were extracted as relevant to the research question, of which 135 were not of interest. Thus, 532 media contributions were defined as the data basis for further analyses, 485 were rejected. This is a share of 52.3% of relevant contributions.

Print media investigations were centered on nine different formats. The national daily newspapers were the media format most frequented with the research topic. From this category, 379 of 595 articles (53.8%) were examined. Each of the 34 relevant articles, both from national weekly newspapers (55 articles) and news magazines (54 articles), accounted for 4.8% of the total analysis.

Regarding the sub-research question, it was noted that the frequency of the TTIP topic in the examined media formats during the analysis period was classified as “high” based on 1017 contributions; thus, hypothesis (H1) was confirmed. Concerning the sub-question

on the frequency of reporting about the agrifood industries and QM, hypothesis (H2) was confirmed, as the relevance was not very pronounced at 52.3%.

#### 4.2. Quantitative Results: Temporal Changes in Reporting

From the sample of 447 articles in print media, 486 analysis units were determined for this question, as several topics were addressed in one article. These analysis units were allocated over the years (Table 2). It was revealed that 285 contributions (58.64%) were related to a specific TTIP event. The TTIP negotiations started in the second half of 2013 and three rounds of negotiations were completed by the end of 2013, thus reporting was rather low. In the following years, public interest increased continuously and various major demonstrations in German cities took place, which resulted in an increase in reporting. Most of the articles related to events were published in the framework of the negotiation rounds (68.3%). Subsequently, of the 13th round of negotiations, 28% of the contributions appeared as debates on regulatory cooperation [6] that also had relevance for the agrifood sectors occurred during this round. The climax of media coverage was evident in 2016, whereupon an abrupt end to coverage was observed with the elections of the US President Donald Trump. In the years 2017 and 2018, reporting on the TTIP was very sporadic, whereby the AFQ Standards no longer played a significant role after 2016.

**Table 2.** Overview of the temporal allocation of coverage of specific Transatlantic Trade and Investment Partnership (TTIP) events per year in the print media and outline of the selected analysis units related to a specific TTIP event during the media analysis.

Year	Specific TTIP Events in The Considered Year	Analysis Units (per Year, in Total)	Analysis Units Related to a Specific TTIP Event (per Year, in Total)	Analysis Units Related to a Specific TTIP Event (per Year, in Percent)
2013	launch of TTIP negotiations; rounds of negotiations 1 to 3	16	9	56.25%
2014	rounds of negotiations 4 to 7	88	40	45.45%
2015	rounds of negotiations 8 to 11; the conclusion of TPP	157	51	32.48%
2016	rounds of negotiations 12 to 15; Obama visits Hannover Fair; TTIP leaks by Greenpeace [51]; G-20 Summit in Hangzhou; US President election	225	185	82.22%
Total		486	285	58.64%

Source: own calculations.

Despite the EU–US Joint Declaration on the resumption of the Transatlantic Partnership [8] on 25 July 2018, and the concrete negotiation mandates and objectives of both the EU [10] and the US [11], the mainstream media had not yet renewed the topic in any meaningful way. The very recent events in the US—the election of Joe Biden and his new trade policies—could not be included in the present analysis in the immediate time, as these events does not cover the analysis period of the media analysis. The focus was on the most important and the high-profile events during the course of the actual TTIP negotiations.

Regarding radio as a medium, increased broadcasting of programs became evident after the publications of the TTIP Leaks by Greenpeace (34.2%). Additionally, the analyzed TV and radio shows indicated that more reports were broadcasted around the rounds of negotiation (20.6%), the opening of the Hannover Messe by Barack Obama (14.7%), and in the context of major demonstrations against the TTIP on 23 April and 17 September 2016 (17.6%). Consequently, to answer the research question, a tendency was discernible in the dissemination analysis, which related the time of publication of a media article to a significant event (print 58.64%; TV 51%; radio 11.8%). The hypothesis (H3) was thus confirmed.

#### 4.3. Quantitative Results: The Embodiment of the Transatlantic Trade and Investment Partnership in the Media in the Context of the Agrifood Industry

This quantitative consideration of positive, neutral, and negative aspects of the TTIP in the context of the agrifood industry was solely conducted in the relevant print media with defined statements (Figure 1). The strategic themes of the EU's trade and globalization policy were reflected in this investigation [52,53]. The results of the print media analysis (Figure 1a) revealed that 38.7% of the relevant contributions contained no positive statements regarding the TTIP, nor did they list perspectives for opportunities or advantages. All other articles often mentioned the predicted benefits of the TTIP as positive aspects, with advantages relevant to the QM among the positive claims. Observing the negative aspects (Figure 1b), it was noted that in 24.2% of the print articles, no negative statements were made. The negative aspects were hardly related to QM, with just 1.34% of the articles referring to a loss of standards. Meanwhile, 47% of the articles contained critics' votes, though they were not heavily dramatized.

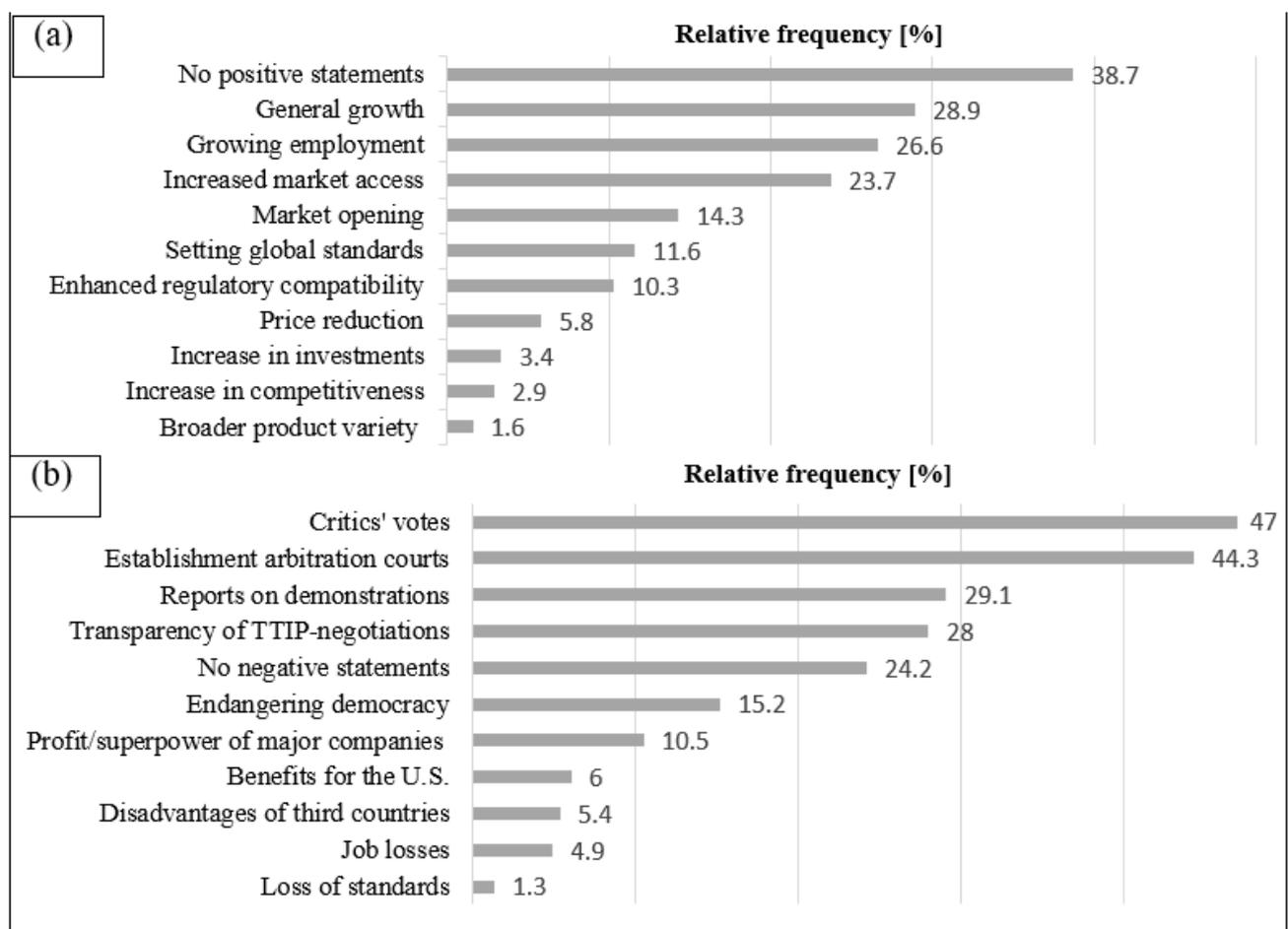


Figure 1. Relative frequencies of positive (a) and negative (b) statements in print media. Source: own calculations.

As expected, based on hypothesis (H4), the results indicate predominantly neutral reporting with unclear opinions on TTIP concerning the agrifood industry during the analysis period.

#### 4.4. Quantitative Results: Reporting on the Standards and Quality Management of the Agrifood Industry Linked with the Transatlantic Trade and Investment Partnership

The thematic context was examined at all types of media using defined keywords (Figure 2). The most widespread use of all the examined keywords was found on TV. With

an average of 51.6% and a maximum of 78.4% on TV, “genetic engineering” was the most important topic. The keywords were used in connection with standards at a mean value of 46.5%, being achieved primarily via TV shows. Printed media were analyzed with regard to the individual branches of the sectors (Figure 3). Among these, the meat and meat products industry (69.8%) was discussed the most. This could be attributed to the divergent hygiene measures of the two negotiating partners, as well as the SPS Agreement of the [54]. Based on the frequency analysis of the thematic context and the industry reference, the hypothesis (H5) was confirmed.

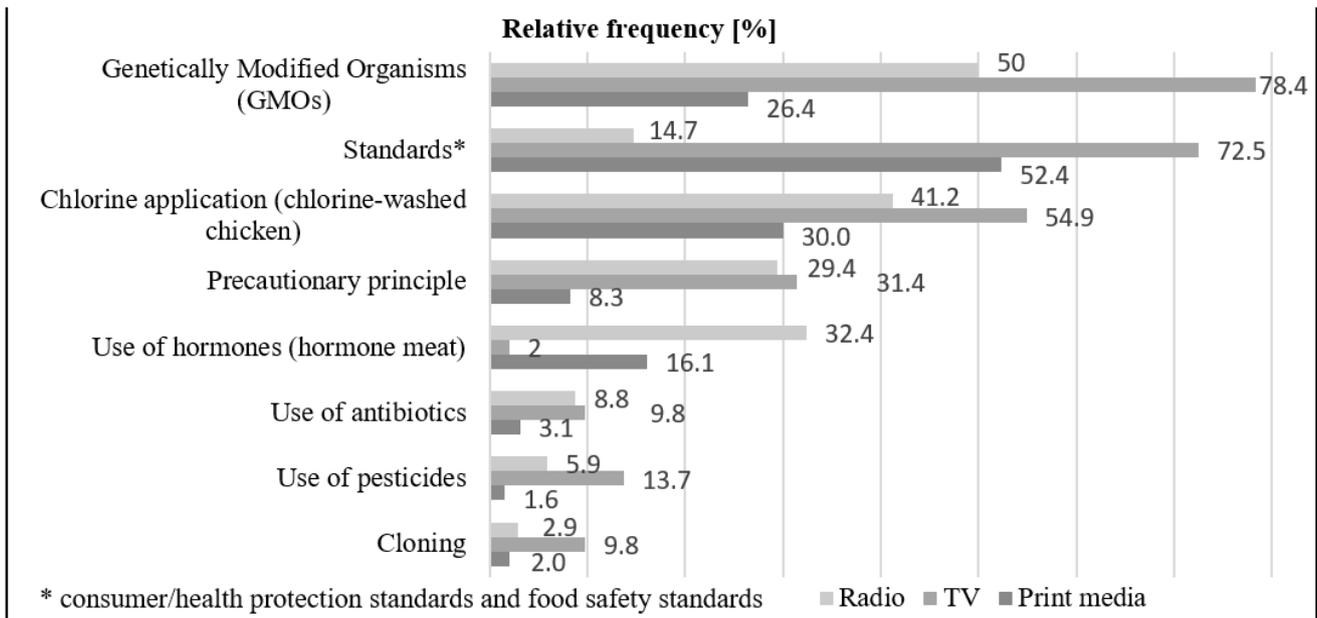


Figure 2. Relative frequencies of industry-relevant keywords differentiated by media type. Source: own calculations.

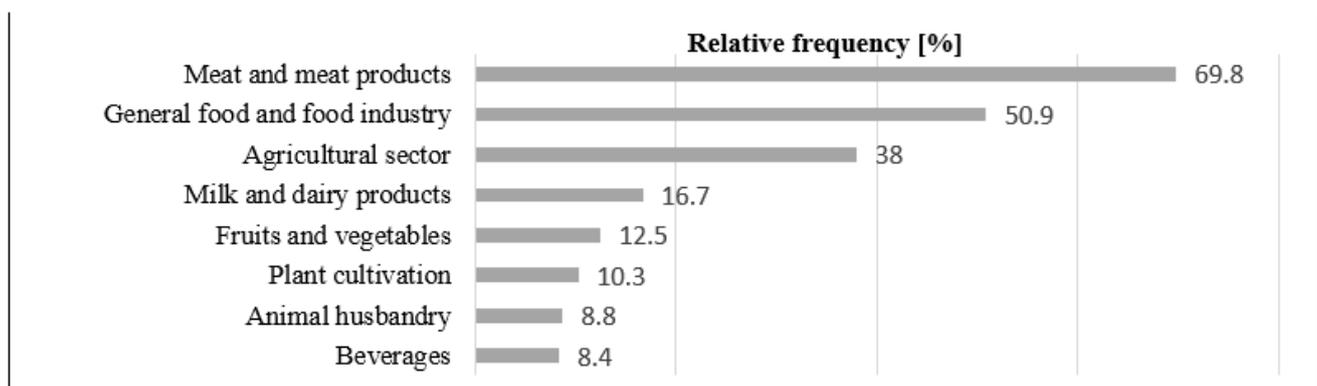


Figure 3. Relative frequencies of printed articles with a specific industry reference. Source: own calculations.

Print media highlighted the impact of the TTIP on various sectors of the agrifood industry. GMOs (28.1%) and the market opening (19.4%) were the most discussed topics. Food safety was mentioned in 13.3% of articles. “Standard loss” (3.4%), “regulatory compatibility” (1.1%), “discrimination of farmers” (0.8%), and “growth potentials” (0.8%) were addressed only slightly. In 48 print articles (10.7%) of this analysis, special attention was paid to QM. The following keywords were mentioned: “standard labels” ( $n = 20$ ; 41.7%), “EU Quality schemes on Geographical Indication (GIs)” ( $n = 23$ ; 47.9%), and certification ( $n = 28$ ; 58.3%). No reference was made to the Hazard Analysis and Critical Control Point concept, Good Manufacturing Practice (GMP), and Good Agricultural Practice.

References to legal regulations and national/regional standards contained 372 printed contributions (83.2%), while only 84 articles (18.8%) alluded to international standards. The general term “standards” was used in 70.7% of all contributions. Besides environmental protection standards (36.8%), consumer protection standards (27.7%) were the most frequently discussed. Food safety terms were mentioned in 14.2% of articles, as well as “hygiene standards” (8.9%), “product standards” (5.4%), and “trade standards” (3.8%). In comparison, the following terms were used very rarely: “quality standards” (1.1%), “animal welfare standards” (1.1%), “sustainability standards” (0.8%), and “organic food standards” (0.3%).

The private standards relevant to the sector were not mentioned in any article. DIN-ISO standards were also mentioned in print articles, but without the individual designation or specific number, so that exact identification was not possible. Thus, it was stated that unclear and inaccurate designations of food safety regulations and standards left readers in the dark and caused confusion. Perhaps the press could have managed to give a non-expert, simple, and clear language version of a specific regulation so that they could get a clear idea.

Regarding statements on standards, it was claimed most often that the TTIP would lead to weaker standards (32%). The harmonization of existing standards was addressed in 31.3% of printed articles. At least one-quarter of the contributions (26.8%) explained that the TTIP would set a benchmark for the future level of standards.

Based on the coverage of the agrifood industry and QM on TV and radio, the connection between the positive, neutral, and negative aspects of the TTIP and selected keywords was quantitatively clarified. Details of the frequency of keyword naming in relation to the image were shown in Table 3.

**Table 3.** Percentage allocation and percentage frequency of the naming of examined keywords of the agrifood industry in positive (+), neutral (~), and negative (-) depictions of TTIP on TV and radio.

Keywords Image	TV (n = 51)			Radio (n = 34)		
	+	~	-	+	~	-
Chlorine-washed chicken	10%	40%	<b>60.7%</b>	0%	38.7%	<b>66.7%</b>
GMOs	33.3%	80%	<b>82.1%</b>	0%	<b>51.6%</b>	33.3%
Use of hormones	0%	20%	<b>46.4%</b>	0%	32.3%	<b>33.3%</b>
Use of pesticides	0%	5%	<b>21.4%</b>	0%	<b>6.5%</b>	0%
Standards	66.7%	<b>80%</b>	67.9%	0%	<b>16.1%</b>	0%
Precautionary principle	0%	30%	<b>35.7%</b>	0%	29%	<b>33.3%</b>
Use of antibiotics	0%	0%	<b>14.3%</b>	0%	<b>9.7%</b>	0%
Cloning	0%	0%	<b>17.9%</b>	0%	<b>3.2%</b>	0%

Source: own calculations. The bold font highlights the highest values.

Considering the frequency with which the examined keywords were presented in terms of a positive, neutral, or negative evaluation, it became evident that all examined keywords were used more frequently with a neutral or negative influence than in positive reporting. Additionally, with few exceptions, increased use of keywords in negative reports compared to neutral reporting was identified. The precautionary principle was presented in a negative light by reporting mainly on the loss or abolition of them.

In conclusion, the research questions were answered and hypotheses (H5 and H6) were confirmed. The mainstream media established a link between the TTIP and the agrifood sectors, as well as QM. Standards were generally presented nonspecifically and very superficially, and loss scenarios were often constructed.

#### 4.5. Qualitative Results

The qualitative analysis was based only on TV and radio reports. A total of 51 TV programs and 30 radio reports were declared relevant, thus 81 media contributions were analyzed. The qualitative questions were examined with regard to the three defined aspects

and their interdependencies, and were analyzed based on the main research question using guidelines.

#### 4.6. Qualitative Results: Analysis of the Media Contribution Regarding Its Scientific Character

To assess whether the TV and radio media platforms ensure that the public are properly informed according to Article 5 of the EU General Food Law [1], the reporting was examined regarding a comprehensive, complete, and scientifically correct presentation. The reports were subjected to a variance analysis with a target vs. actual comparison.

It was observed that the mainstream media used different tools to shape the public opinions: verbal and non-verbal methods of communication, stylistic elements, suggestive power (combination of moving images, sound, and live reporting), used sources of information, and the manner of wording.

Moreover, it was found that a unilateral reporting and rudimentary reflection of the negotiating positions produced depictions of the topic that cast it in a positive light. In the negative reports, the recipient's emotions were predominantly portrayed through dramatizations, musical effects, visual means, and evaluative linguistic formulations, as well as a one-sided and generalized description. GMOs and the symbol of the "chlorine chicken" were the most frequently used objects in making the public aware of the dangers of TTIP for the agrifood industries. AFQ Standards were mentioned marginally.

Additionally, radio broadcasts were less informative than longer TV broadcasts due to their shorter length. Apart from that, the level of information was dependent on the focus of the analyzed contributions, as more detailed information was provided on topics other than the agrifood sector. This supported the analysis of used information sources, as 98.3% of all examined report statements were made about the agrifood sector by persons who were not experts in the field.

In summary, it was found that only limited knowledge of the facts and benefits were conveyed to the recipients by generalizing descriptions. The results suggest that mainstream media were unable to empower the recipients to form their own comprehensive and differentiated opinions, leading to an assessment of the reporting as non-scientific, which confirmed the hypothesis (H7). The principle of proper information based on the General Food Law [1] was not granted.

#### 4.7. Qualitative Results: Analysis of the Use of the Term "Quality Standards" of the Agrifood Industry in Media Reporting

All contributions with references to AFQ Standards were examined concerning the use of the terms in the media. In 75% of the print articles, the term "standards" was generally used or merely mentioned. An explicit naming or confusion could only be determined in rare cases (<1%). In the case of TV and radio, it was noted that AFQ Standards were generally mentioned, but not explained. Misuse of terms or other interpretations could not be found significantly. General statements on quality standards were most frequently provided by TV stations (53%), while they were minimal on the radio (17.7%). In all media, a combination of the general explanation of possible alterations of standards and further enumeration of keywords could be noticed, without either being discussed more intensively. All media were dominated by statements about the lowering or loss of standards because of the TTIP-FTA, with none of the examples citing detailed content or concrete AFQ Standards that would change by the agreement.

Therefore, there was a recognizable trend that the term "standards" was used by the media to describe the European legal regulations in force, while they failed to mention specific European or international standards. Surprisingly, private standards were completely disregarded. Consequently, hypothesis (H8) regarding the inconsistent use of the term "quality standards" with regard to the terminology used in QM was confirmed by contingency analysis.

#### 4.8. Qualitative Results: Analysis of the Reporting on the Agrifood Industry and Quality Management Linked with the Transatlantic Trade and Investment Partnership

All 81 relevant media articles related to QM in the agrifood industries were examined regarding the positions presented in the context of the TTIP. To understand the importance of the AFQ Standards regarding the TTIP, the overall impression of the widespread opinion was examined. The following evaluation focused on the issues identified by Matthews (2016) [20] as the basis for fears and negative opinions of the public. To measure the statements' strength, the individual topics were clustered into three blocks (Figure A1):

- Mutual recognition of standards: harmonization of standards, different levels of protection for the two negotiating parties, concern about minimizing the EU's protection level, and intervention or influence of the US in EU standard-setting.
- Different paradigms in risk assessment: the precautionary principle of the EU and the scientific approach of the US.
- Sanitary and phytosanitary measures (SPS measures): statements on hygiene standards using the example of chicken (chlorine-washed chicken), hormone use and antibiotic use in meat production and cloning; statements on pesticide use, and GMO food and feed.

Through the differentiated analysis of media contributions in three clusters, the statements' strength was analyzed. To classify the qualitative facts, it was essential to develop an evaluation method that describes the position and global view universally. Therefore, a manual sentiment analysis was conducted using sentiment scores (SeSc).

Each media statement was evaluated by content, documented in a guideline, and assigned to a SeSc by denoting  $-1$  (negative),  $0$  (neutral), and  $+1$  (positive). Table 4 shows the results, as well as those topics where specific AFQ Standards were presented and explained by the media.

**Table 4.** Overview of the qualitative sentiment analysis of media reports (TV and radio) on the three clustered topics and assessment on their explanations regarding specific AFQ standards.

Three Clustered Topics	Number of reports with SeSc $-1$ (Negative)	Number of Reports with SeSc $0$ (Neutral)	Number of Reports with SeSc $+1$ (Positive)	Explanation of AFQ Standards (YES/NO)
Mutual recognition of standards	19	<b>21</b>	2	NO
Different paradigms in risk assessment	11	<b>15</b>	0	NO
SPS measures	62	<b>74</b>	4	NO
• Chlorine-washed chicken	9	20	3	NO
• GMOs	24	32	1	NO
• Use of hormones	14	14	0	NO
• Use of antibiotics	4	4	0	NO
• Pesticides	6	3	0	NO
• Cloning	5	1	0	NO
Total number of reports	92	<b>110</b>	6	

Source: own calculations; Results are expressed by  $-1$  (negative position of media),  $0$  (neutral position of media), or  $+1$  (positive position of media). SeSc, Sentiment score; AFQ Standards, quality standards in the agrifood sector; SPS measures, Sanitary and phytosanitary measures; GMO, Genetically Modified Organism. The bold font highlights the highest values.

#### 4.8.1. Mutual Recognition of Standards

The majority of reports on this topic was neutral (Table 4). Nevertheless, there was a very high number of negative reports, which tended to lead to more negative reporting. Different statements were made concerning the planned mutual recognition of quality standards. On the one hand, the media argued that divergent food and consumer protection standards might not be accepted through mutual recognition. Thus, the different levels of protection ought to be maintained in the future and common standards developed on both sides of the Atlantic. This should prevent competition from goods with lower standards. On the other hand, the media classified the mutual recognition of standards as an acceptable negotiating point as long as appropriate labeling of origin and production processes was mandatory. The different levels of protection between the standards were discussed critically, but specific standards were not mentioned. Particularly, they referred to the plans of the US to lower the strict EU standards to the level of US standards through the TTIP. Neutral statements were made in the majority of the contributions, which ensured the permanence of existing import bans and excluded a reduction of protection standards.

Additionally, some media articles assessed the different perceptions between the EU and the US on quality criteria and repeatedly argued that the EU does not have higher protection standards in all areas. Examples of higher US standards were lower limits for contaminants and pesticides in fruit juices, stricter microbiological regulations for raw milk products, and prohibited integration of toys in food. Note that none of the topics referred to specific AFQ Standards.

In conclusion, the present study revealed that both trading partners would be perfectly feasible for the mutual recognition of the existing standards, as well as for collaboration on future standards, although the fundamental differences of the established food safety system are expected to remain. Obviously, the potential for improvement for both partners is enormous. The elimination of non-tariff barriers to trade in all current and future negotiations of FTAs is therefore of significant importance for future specifications regarding the quality of European agriculture and food production.

#### 4.8.2. Different Paradigms in Risk Assessment

Table 4 shows that most of the reports on this topic were neutral, with a very high share of negative reports. The EU precautionary principle (see Table S2) and the US scientific approach were at the focus of the examination of this topic group, whereby different points of view and argumentation structures were found. While some supporters of the TTIP argued that the precautionary principle should be maintained, others maintained that both the precautionary principle and the scientific principle were effective approaches that should be combined in the future in the best possible way.

It was noted that the European level of protection was not essentially better than the US level. This thesis was illustrated by the example of the BSE crisis, when the US imposed stricter and faster import bans on beef to protect consumers, compared to the EU. Moreover, the majority of contributions called into question the compatibility of the two approaches to risk assessment. According to the reports, the reason for this was the recognition of the science-based evidence in food safety regulations. A serious risk was posed by the fact that the US would classify essential European protection philosophies as not scientifically justified and would, therefore, be skeptical about the research and the independent opinions of the European Food Safety Authority (EFSA). Further, attention was paid to ethical and moral aspects that were not anchored in US law. Additionally, environmental and animal protection would be of minor importance in the US approach.

The media clearly stated that the US would demand the adoption of scientific principles, and this would be a threat to European standards. It was explained in this context that all protection mechanisms applied in the event of damage would be abolished and the consumer would, therefore, be unprotected.

Another field of conflict presented by the media was the European approach to process hygiene, “From Farm to Fork”, which contrasts with the “end-of-pipe” principle of the US. Although both approaches would aim at preventing potentially adverse effects that could be caused by unsafe food products, feedstuffs, or contaminated raw material, their structures were fundamentally different. While in the EU, a complete monitoring of the entire value chain regarding compliance with hygiene standards was legally anchored, the US emphasized the treatment of the final product.

Ultimately, the media failed to explain concrete standards in this regard. For example, DIN EN ISO 22,000 could be mentioned and explained by the media to generate sufficient information for recipients.

#### 4.8.3. Sanitary and Phytosanitary Measures

The purpose of the 1995 WTO SPS Agreement is to ensure the protection of life, as well as the health of humans, animals, and plants from risks arising through direct or indirect international trade [55]. The topics selected for analysis are related to the SPS agreement and were often controversially discussed during the TTIP negotiations. According to the results (Table 4), the German media reported in a predominantly neutral manner about the issues. Despite this, a very high share of negative reports was also recorded, which may imply a negative impact on the consumer. To clarify that, this needs to be investigated in future consumer research.

##### Chlorine-Washed Chicken

It was found that the media’s argumentation of false statements concerning “chlorine chicken”, as well as other stereotypes, clouded the TTIP’s chances and failed to properly inform the public. The media repeatedly stressed that the EU’s meat hygiene standards were much better than those of the US and that chlorine treatment of chickens would be “disgusting”, thus triggering the so-called “disgust debate”. The recipients were not informed that The German Federal Institute for Risk Assessment (BfR) had indicated that the measures adopted in European meat production were not providing sufficient consumer protection, so treating meat with chlorine would be appropriate if combined with other measures along the production chain [56]. Thus, according to the BfR, there would be no reason for the European consumer to refuse this treatment option to remove *Campylobacter* and *Salmonella* from poultry meat [56]. The positive effects of chlorine, such as the efficient and residue-free neutralization of pathogenic microorganisms, and thus the reduction of meat contamination, were not highlighted by the media in any article. The EFSA study was also not mentioned [57], which could not identify any harmful products because of decontamination of chicken meat via chlorine dioxide.

Despite insufficient technical and factual reporting, the contributions examined were rather neutral concerning the positioning of the media.

##### Genetically Modified Organisms

Another predominant reporting topic was the placing on the market and labeling of GMOs. The TTIP was predefined as a door-opener for GMOs in the run-up to the negotiations because the EU granted authorization for the placing on the market of food and feed containing genetically modified maize 1507, thus signaling a strong interest in negotiations with the US. As a result, the media became concerned that a chain reaction would result from the individual approval of certain GMO varieties. As a marginal example, the weakening of the labeling of honey (since June 2015) obtained from GMO plants (pollen) was cited. It was pointed out by the media that a complete ban on GMOs in Europe would lead to rising prices for agricultural businesses, which would be faced with an immense economical dilemma and would have no chance to succeed in international competition.

In principle, it was found that the US was portrayed negatively on the subject of GMOs because there would be neither approval regulations nor labeling obligations. Additionally, the US declared the European GMO regulations as trade barriers, which would have to be eliminated by the TTIP. Consequently, an import of unlabeled GMO products from the US would affect the free choice of European consumers and would increase competition and price pressure on European food producers. By further comparison, the media explained that in the EU, the limits of GMOs are mainly of ethical origin; therefore, more than 90% of German consumers would reject GMO foods. While some media articles insisted on maintaining the clearly defined mechanisms and strict criteria for the authorization of GMOs in the EU, other articles discussed refined coordination processes between the US system and European requirements.

The analysis partially confirmed the findings of Vigani and Olper (2013) [22] by addressing consumer rejection of the use of GMOs in all media. As described in previous research [23–26], the analysis also revealed that TTIP critics use consumer ignorance to create negative emotions about the FTA. Moreover, the term “standard” was used as a synonym for legally anchored regulations that describe common manufacturing practices. Throughout GMO reporting, the media failed to address specific standards. Private standards and labels were not significantly mentioned or explained.

Although the media often reported negatively and inadequately, the position of the media in its entirety was considered neutral, as different aspects were taken into account, which, on the one hand, emphasized the rejection of GMOs in the negotiations and, on the other hand, the importance of its use.

#### Use of Hormones

The ban on growth hormones in 1981 was the result of years of legal proceedings between the EU and the US [58] and was therefore repeatedly presented in media reports regarding the TTIP. It was medially explained that different hormone classes were used in animal breeding in the US, though with the exception of Ractopamine, they were not specified. The media raised public suspicion that the conclusion of the TTIP agreement could force the EU to allow the use of growth hormones in animal husbandry and the unrestricted import of “hormone meat” without consumers being sustained by labeling requirements. The topic of the use of hormones was mainly addressed by TTIP critics and had only a negative symbolic function. International or private standards were not discussed.

#### Use of Antibiotics

The media also commented on the difference between the EU and the US as it related to their use of antibiotics, whereby the focus was not on standards but production or breeding regulations. It was argued that organic farming requirements were stricter in the US than in the EU. In this context, only the aspect of antibiotic therapy of sick animals in organic animal husbandry was covered, though the differences in the use of medications as growth promoters were not. Additionally, some media reports linked the precautionary principle with the use of antibiotics by comparing the precautionary use of antibiotics in European agriculture with the end-product aftercare chlorine treatment of chicken meat in the US. This indicated that specific legal and scientific basics were not properly investigated and could mislead the reader. In this case, equating the use of antibiotics with chlorine dioxide-based decontamination implied that antibiotics could be used to disinfect carcasses. The presentation of the differences in the uses of antibiotics thus showed that, in addition to a lack of consideration of AFQ Standards, scientific facts were also misrepresented by the media.

### Pesticides and Cloning

These topics were only mentioned in a few analyzed items, whereby this was characterized by rather negative reporting. Regarding the agricultural pesticides, various media emphasized that the EU and US limits for residues in food frequently differ significantly, with the European requirements described as stricter in all cases, e.g., residues in baby food and banned pesticides used in the US. By contrast, it was stressed that thresholds for pesticide residues in the US are 300–500 times higher than in the EU. Through the TTIP, the unrestricted importing of foodstuffs treated with prohibited pesticides was feared. Besides the risk was posed that future regulations on residues of potentially carcinogenic pesticides and the further reduction of existing limit values could be prevented through the TTIP. The cloning of animals was predominantly used in the media as a deterrent example, which would be imported to Europe in an unwelcome way due to the TTIP. None of the contributions addressed animal welfare standards or the legal and scientific background of animal cloning.

Moreover, statements on the ethical and moral concerns about the procedures were used to address emotional aspects to convey the threats of a possible TTIP agreement in the interest of consumer safety. Neither for pesticides nor for cloning were references made to AFQ Standards that could be affected by the TTIP.

The results of all three aspects for assessing the importance of AFQ Standards demonstrated that the media reported neutrally with a negative skew. The sentiment analysis confirmed the hypothesis (H9) of a neutral opinion.

### 5. Conclusions and Policy Implications

Motivated by the necessity to achieve a better understanding of media coverage concerning AFQ Standards regarding globalized trade, this paper has empirically assessed this relationship using the TTIP as an example. To the best of our knowledge, this is the first study on this topic. The present analysis identifies a neutral debate on the AFQ Standards, with noticeable negative explanations regarding the possible changes introduced by an FTA. The reporting, however, showed considerable deficiencies regarding the technical and scientific explanations of the food safety regulations and, most importantly, the AFQ Standards, indicating a trend toward information asymmetries. The fact that neither legal regulations nor international or private standards were explicitly mentioned or explained by the media was regarded as highly problematic. The principle of proper information of the public was not fulfilled by the media. This means that recipients of media coverage could not gain a comprehensive overview that would enable them to classify the actual changes or risks in the agrifood sector as a result of free trade agreement appropriately. Moreover, the media followed the usual practice of making politics the scapegoat. This content analysis could be a first step in the research of the public awareness and attitudes because the role of the media likely forms the public opinion and therefore might influence the debate concerning trade negotiations, which would be interesting to follow up in future studies. A limitation of this study is its restricted sample of Germany's media landscape. Reproducing similar designs in other countries with the awareness of the importance of international quality standards regarding global trade and food safety will likely lead to interesting, contrasting results. Further works are necessary to more critically examine whether mainstream media reports on changes in consumer attitudes affect quality standards in globalization.

Additional studies are suggested for the target group of export-oriented companies in the agrifood industry, regarding the level of knowledge and acceptance of product quality and AFQ Standards with regard to the development of free trade agreements. Within the framework of the authors' research project, Germany [59] and Poland [60] have already been studied; further countries should also be examined in more detail.

Finally, this study serves as a starting point for an appropriate information strategy as anchored in the General Food Law of the EU [1]. The results indicate that each individual EU Member State, together with the EU Commission, has to adopt a proactive and

interactive approach to agrifood governance. As a means of countering any misinformation for the public, transparent decision-making processes should not be neglected in this operation [21,61,62]. For this reason, it is proposed that a public debate with a high level of information be provided in the future. A solid information strategy on free trade of agrifood products would help to explain the food safety rules in the correct context, so as inform the recipient and not to confuse. It should be emphasized that the speculations of the mainstream media, e.g., chlorine-washed chicken, have absolutely no relation with the existing AFQ Standards and quality management.

During the TTIP negotiations, no other industry was the subject of such detailed and emotional media coverage as the agrifood industry. It is evident that media coverage of quality standards during the pre-phase of future FTAs will continue to play an important role in shaping public awareness. Thus, the study also raises the issue of interaction between the media and the government. Latent interdependencies should be studied to determine whether media rely on governments as important sources of relevant information, while governments rely on media to communicate their food quality policy.

A further important finding is that private standards (e.g., IFS, GlobalGAP, and QS) were not relevant to media coverage in any way. Descriptions of their objectives, influences, and their further development and effects on food safety in global trade were completely omitted by the media. Consequently, it is of particular importance to examine the relevance of private standards to European trade policy for agricultural goods and foodstuffs in subsequent studies.

Finally, it should be underlined that the differences between the EU and the US are in the legal area (differences in risk management) and not in the private sector standards. To the best of our knowledge, the basic legal differences will continue to exist in the future. Furthermore, the private sector food safety standards, which are already approved, will continue to exist. However, we see a need to develop them further, e.g., due to the current SARS-CoV-2 pandemic and economic sustainability. This could be achieved by integrating not only the product and process standards, but also the occupational safety standards relating to the corporate culture and the behavior of employees [63] into quality management.

**Supplementary Materials:** The following are available online at <https://www.mdpi.com/article/10.3390/agriculture11040328/s1>, Tables S1a–c: Overview of the surveyed German media; Table S2: Explanation of important terms (in alphabetical order).

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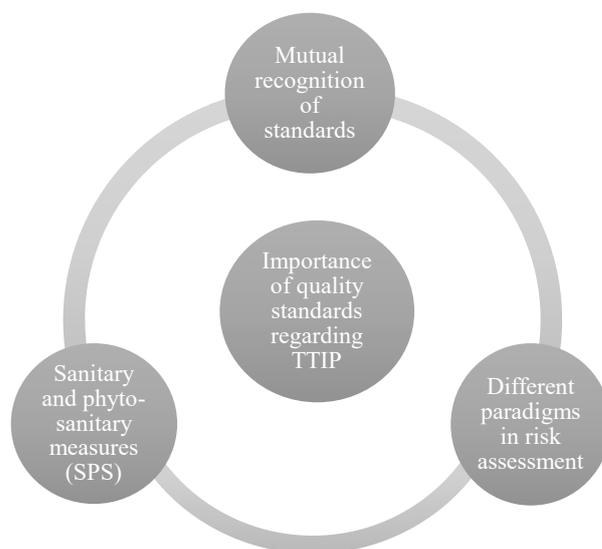
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## Appendix A



**Figure A1.** Overview of the topics for assessing the three blocks of qualitative media analysis. Source: own description.

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