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# An exploration of agro-food chain distributive, procedural and interactional fairness in food products

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Fairness and ethical values in agro-food chain lay at the center of the current debate on agro-food chain sustainability. The food labels may contain elements focused on agro-food chain management fairness practices. The objective of the present study is to explore what types of fairness agro-food companies value in the food products they commercialize, and if the characteristics of agro-food companies have a relationship with the type of fairness valued. The research study collected 226 commercialized food products containing information on the agro-food chain fairness practices companies adopted to produce the food products. Data elaboration included a cluster analysis to identify groups of fair products, and a multinomial logistic regression to explore the relationship between the identified clusters and fairness types, organic, nutritional and functional claims, and price. Results support that fairness-oriented products provide information on different types of fairness that is distributive, procedural, and interactional. Some products provide economic information on the distribution of price between upstream and downstream actors. Other products focus on procedural and interactional fairness practices, such as dignity, respect and transparent relationship in agro-food chain; technologies used in the production and distribution of the product; and ethical certifications that companies hold. Fairness-oriented information differ depending both on the type of chain actor commercializing the product, and on the type of brand, that is whether commercial brand or private label. The main conclusion is that companies convey fairness-related information to consumers differently according to company's role in the agro-food chain. Yet, there is need to exploit further the potential role of fairness practices in defining effective business strategies to contribute to higher equity and sustainability in the agro-food system.

## KEYWORDS

food system, fairness, ethics, agro-food chain, food, retailer, producer, processor

## 1. Introduction

The agro-food sector is facing several challenges. Fairness, transparency and ethics in the agro-food chain can contribute to agro-food system sustainability. Agro-food chain actors, from farmers to processors, retailers, and consumers place growing interest in these values. Thus, agro-food companies increasingly share and value information on their agro-food chain management policies. Companies are aware that consumers are more conscious of the impact of their choices on the environment, society, and animal welfare. This information focuses on whether products are fairly sourced, produced and distributed.

Yet, fairness, transparency and ethics also give rise to potential risks such as greenwashing and ethics washing, which can undermine the efforts towards sustainability and responsibility. Some researchers highlighted that some claims and narratives about fairness might be used as a cover for greenwashing or ethics-washing operations. In particular, greenwashing and ethics-washing may lead to overstating or misrepresenting environmental and ethical practices to create a positive image without substantial actions behind the claims (Mahoney et al., 2013; DeFries et al., 2017; Fiala et al., 2021; Ferreira-Quilice et al., 2023).

Fairness-oriented claims focus on food companies' practices, as well as their suppliers' practices. In particular, they refer to distributional issues such as fair price for farmers, fair remuneration, farmer cost, and price distribution quantification among agro-food chain actors. Some companies prefer to share information related to procedural fairness, such as cooperation between farmers, embodied technologies, and fair trade certificate. Other companies focus on interactional fairness information, such as trust, respect, dignity, honesty, child labor, discrimination issues within the agro-food chain they join.

Agro-food companies investing on fairness may adopt different management and marketing strategies, such as sharing information on fairness-oriented practices towards and of the suppliers, and setting fairness-oriented brands, including commercial and private labels. The strategies may differ according to the role of the company along the chain. Farmers, producers and retailers could value different practices of agro-food chain fairness, and decide to communicate some aspects rather than others.

Despite notable progress in conceptualizing the ethical aspects of supply chains in recent years, translating these principles into tangible outcomes, and effectively evaluating their concrete impact remain challenging tasks (Fairtrade International, 2021a; Ribeiro-Duthie et al., 2021a,b; FAO, 2016, 2019). Past literature properly defines the different types of fairness, and some agro-food companies may pay increasing attention to fairness values. However, there is limited knowledge and data gaps on the actual practices aimed at fairness in agro-food chains, as well as on how companies that claim to adopt fairness-oriented practice actually disclose and value their fairness practices in their marketed products.

This study aims to contribute to fill the latter gap with a comprehensive approach. The research questions aim is to explore what types of fairness agro-food companies value in the food products they commercialize, and if the type of agro-food company has a relation with the type of fairness valued. Thus, this study aims to contribute to the debate, providing a new and more comprehensive perspective on how companies approach fairness issues in the agro-food sector.

## 2. Agro-food chain fairness in past literature

### 2.1. Distributive, procedural and interactional fairness

Past literature grouped fairness under three main key categories: distributive, procedural and interactional fairness (Samoggia and Beyhan, 2021). Distributive fairness refers to the tangible outcome of exchange and how this is distributed among chain actors. It focuses on the fair allocation of outcomes among actors within the agro-food chain (Adams, 1965). Procedural fairness analyzes how outcomes are obtained. It deals with the procedures adopted in the negotiation among chain actors and refers to how the chain actors perceive the processes by which outcomes are achieved and distributed. It addresses the aspects of the communication and interaction aimed at establishing a fair decision-making procedure. Understanding, transparency, capacity building, awareness of the chain conditions and standards are part of it (Thibaut and Walker, 1978). Interactional fairness reflects the degree to which chain actors are treated with politeness, dignity, transparency and respect by those executing procedures. Moreover, it deals with the quality of the information provided, focusing on the reasons of the procedures adopted or why outcomes are distributed in a particular way (Bies and Moag, 1986).

Past studies addressed how food companies adopt three different concepts of fairness in company management practices. They highlight that some companies underline distributive fairness issues specifying that producers are fairly remunerated and receive a fair price; others clearly show the price distribution among the agro-food chain actors (producers, retailers, processors; Rimal and Moon, 2005; Chang and Lusk, 2009; Toler et al., 2009; Zander and Hamm, 2010; Briggeman and Lusk, 2011). Other studies show that many companies also share information about procedural issues. Food processors or retailers provide information about the adopted procedures resulting in the distribution of the agro-food chain prices. Long-term contracts with fixed prices and volumes contribute to provide fair conditions both for farmers and other actors within the chain. These upstream chain actors specify that they work in close cooperation with their suppliers (e.g., long-term cooperation, product quality agreement with suppliers, price setting criteria, farmer cooperatives, producer organizations, Interbranch organization—IBO). Food processors or retailers may adopt agro-food chain technology innovation projects to favor transparency and trust among the chain actors (e.g., blockchain, digital platform, etc.). Particularly, the blockchain technology plays an important role in ensuring transparency since it provides traceability for all the chain actors (Nosratabadi et al., 2020; Stranieri et al., 2021).

Many companies, on the other hand, share information about the relationships between downstream (retailers) and upstream (producers and processors) chain actors. In particular, some agro-food companies stand out for their respect of human and ethical values by including fairness-focused certifications (Corallo et al., 2021). For example, food processors or retailers specify that they guarantee “no discrimination” and “no child labor” practices; or they are against gangmastering, support labor rights and wages, workers' working conditions, treat their suppliers with politeness, dignity, respect, establish trustful relationship with farmers (Greenberg, 1990;

Colquitt et al., 2001; Zamfir, 2019; Associazione Terra, 2021; Luig, 2021).

## 2.2. Interactions among fairness practices

There are studies highlighting the interconnections among the different fairness concepts. Sun et al. (2018) explored the effects of information sharing, price satisfaction, and environmental stability on the perceptions of distributive fairness and procedural fairness. Some authors consider each of the three types of fairness in their studies. Duffy et al. (2003) consider fairness as prices, payment terms, bilateral communication, policies to deal with conflicts, sharing of information, awareness of conditions, and mutual respect. Griffith et al. (2006) analyzed the ability to build relationships, communicate and exchange information about outcomes and rewards, and other specific issues (credit terms, pricing issues etc.). Gu and Wang (2011) focused on fairness highlighting aspects such as profit allocation and mutual respect among suppliers. Kashyap and Sivadas (2012) define fairness as adequate rewards, procedures, policies and respect.

## 2.3. Fairness and food labelling

Agro-food companies can value fairness information and want to convey their virtuous practices to consumers. Recent decades have witnessed growing consumer demand for foods bearing ethical claims (Barham, 2002; Conner et al., 2008; Reynolds, 2009; Samoggia et al., 2021). Food labelling is a common carrier for sharing ethical and product information. It can contribute to promote food traceability process and to reduce the information asymmetry between chain actors and consumer. The labelling strategy can be aimed at increasing the food product differentiation (Grunert, 2005) to meet the consumers' requirements and preferences (Corallo et al., 2021). If properly communicated, this "difference" can produce additional value for the product (Marchini et al., 2021).

The food label is used as a tool to share a number of information about the product, such as the manufacturer history, the brand, the ingredients, and the claims. The information can change according to the role played by the actors within the chain. Massa and Testa (2012) studied the nexus among food retailer labelling strategies, transparency and distributive fairness, and indicated that everyone should have the right to access top quality fair priced goods. Hooker (2003) supported that food processors use food labelling to provide transparency in management practices. Deresa (2017) provided a comprehensive empirical study by highlighting the role of consumer association-cooperatives in label information, price stabilization and fair price, and in promoting products at a lower price as compared to private traders. Christensen (2015) discussed the importance of fairness in cooperatives by highlighting the role that labelling can play in ensuring transparent and comprehensive information. The study aimed to build a bridge between economic concerns and distributional issues and ethics.

## 2.4. Fair trade

Since fair trade labelling highlights the relationship between fairness and agro-food chain actors, it is an important tool that

responds to the increasing consumer's need of transparency and detailed information on food products' fairness. The origins of certified fair trade were rooted in the practice of alternative trade and committed both to a fair price and to a different type of trading relationship (Eshuis and Harmsen, 2003; Huybrechts and Reed, 2010). Fair trade labelling organizations commonly adopt a well-defined concept of fair trade, established by FINE, an informal association comprising four international fair trade networks: Fairtrade Labelling Organizations International, World Fair Trade Organization (WFTO), Network of European Worldshops, and European Fair Trade Association (EFTA). As per this definition, fair trade represents a trading partnership built on principles of dialogue, transparency, and respect, with the ultimate goal of achieving greater equity in international trade. These fair trade organizations, supported by conscientious consumers, actively assist producers, raise awareness, and advocate for transformative changes in the conventional practices and rules governing global commerce.

Several reputable fair trade certifiers exist, including Fairtrade International (formerly known as FLO, Fairtrade Labelling Organizations International), IMO, Make Trade Fair, and Eco-Social. The collaborative efforts of fair trade organizations, along with the active support of consumers, have laid a foundation for ethical trade practices, fostering positive change and empowering both producers and consumers to participate in a more just and sustainable global market (Nicholls and Opal, 2005; Hayes, 2006; Nicholls, 2010; Globescan, 2019; Fairtrade Foundation, 2021; Fairtrade International, 2021b; Yamoah and Yawson, 2023).

The main objective of fair trade label has not changed over the years, but its scope has expanded to its present form. The Fairtrade label and certification system synthesizes a number of standard criteria aimed at providing a livelihood and quality of life to small farmers, as well as decent work conditions and fair wages, particularly in developing countries. Considering ethical and fair standards, the label was developed with the intention of building a premium for farmers (Loconto and Dankers, 2014). Over the past years the sales of fair trade goods have grown (Nicholls and Opal, 2005; Hayes, 2006; Nicholls, 2010; Yamoah and Yawson, 2023). Historical data show that global fair trade sales passed from around 5 billion Euros in 2011 to around 10 billion Euros in 2018 (Statista, 2019). Recent data support that the British market witnessed a notable surge, with total sales of Fairtrade products increasing by over 14% (Co-op, 2021; Fairtrade International, 2022). Similarly, the German market show that fair trade products amounted to about 29 million Euros in 1993 and increased up to 2.36 billion in 2022 (Statista, 2023).

Literature about fair trade enables crucial insights into the functioning of a specific market, the profile of its actors, and its certification process. Coulibaly and Blanchot (2015) focused on the nexus between agriculture chain actors and fair trade certificate. Fair trade helps producers, importers, and retailers to accomplish equitable distribution of the gains between marginalized producers, traders and consumers (Hira and Ferrie, 2006). However, producers play a secondary role in the selection of the certification body, unlike importers, distributors, and associations holding a fair trade label. Nuseva et al. (2014) indicated that fair trade aims to contribute to sustainable development by promoting environment-friendly technologies, corporate social responsibility, human rights, and raising consumer awareness. Wang and Chen (2019) examined the effects of perceived fairness of fair trade organizations on

consumers' purchase intention toward fair trade products. Their findings showed that information on distributive and procedural fairness have positive effects on perceived effectiveness of fair trade. Naegele (2020) indicated that fair trade label affects bargaining power or market power between farmers and retailers. Fair Trade cooperatives and networks play a key role in delivering fair Trade products worldwide, as confirmed by the remarkable growth in sales observed over the past two decades, thanks to specialized shops and consumer cooperatives (Nuseva et al., 2014; Overbeek, 2019; Fairtrade International, 2022; Alemany et al., 2023; Yamoah and Yawson, 2023).

### 3. Materials and methods

#### 3.1. Data collection

The data collection was carried out in 2022 by a team of researchers. They defined an inventory of 226 food products marketed with at least one of the fairness dimensions, and mainly available on the Mediterranean countries' food market. As Annex 1 shows, each type of fairness includes sub-dimensions, which are listed according to the fairness dimension they belong to.

The information on the products derives from three sources: food products' labels, companies' and products' websites, store-checks, and companies' or products' annual or monthly published reports. During the data collection phase, regular meetings and workshops were organized among data collection researchers to define and agree on the data collection instrument and monitor advancements in data collection.

The research study collected data on a set of information to profile fair products' characteristics, that is products' prices, categories, company types, brand types, fairness types, whether the product were organic, and had nutritional and functional claims. Products' prices were divided into two categories: "below or equal to 5 Euro" and "above 5 Euro." The company types were grouped in four categories "Producer," "Processor," "Retailer" and "Association." Products' brand types consisted of two categories: "Commercial Brand" and "Private Brand." "Organic" and "Nutritional and functional Claims" were managed as binary variable as "Yes" and "No." The study analyzed the types of fairness that food products had, considering the detailed fairness criteria (Annex 1): "Yes" indicated that the products conveyed a specific type of fairness sub-dimension, "No" indicated that they did not convey a specific type of fairness sub-dimension. Food products could have more than one fairness sub-dimension.

#### 3.2. Data elaboration

The data elaboration consisted of two consecutive analyses. The first step applied the Hierarchical Clustering Ward's algorithm to define the optimal number of clusters, followed by the non-hierarchical K-means method. The Hierarchical Clustering Ward's algorithm was adopted from the agglomerative approach, which can be easily pictured as a 'bottom-up' algorithm on dendrogram (Murtagh and Legendre, 2014). At each step of the algorithm, the two clusters that are the most similar are combined into a new bigger cluster. This procedure is iterated until all points are member of just one big cluster.

In this analysis, after selecting the optimal number of clusters, k-means method helped to determine components belonging to the clusters. Clusters were then analyzed to define differences among groups concerning brand and company types by Pearson's chi-squared significance, Fisher exact and Likelihood-ratio chi2. These are statistical tests used to determine if there are nonrandom associations between two categorical variables. Nevertheless, Fisher exact and Likelihood-ratio chi2 are also shown to increase reliability of the results. In this analysis, null hypothesis is rejected since *p*-values are less than 0.05, which means categorical variables have an associated relationship.

The second step of the analysis applied a multinomial logistic regression. Multinomial logistic regression was used to construct statistical models to describe the relationship between clusters and three types of fairness, food prices, nutritional functional claims, organic food. Mlogit models are a straightforward extension of logistic models, where the analysis is performed by *M* categories. One value is designated as the reference category. The probability of belonging to other categories is compared to the probability of belonging to the reference category. With *M* categories, this requires the calculation of *M*-1 equations, one for each category relative to the reference category, in order to describe the relationship between categories and variables (Liao, 1994).

### 4. Results

#### 4.1. Fair products characteristics

Results support that interactional and procedural fairness are prominent among fair food products. The products with a price equal or below 5 € are the most significant group. Commercial brand products prevail on private label products, and there is a slight prevalence of processors as company type. About half of the products comes from organic production, while a lower percentage contains nutritional and functional claims (Table 1).

#### 4.2. Fairness sub-dimensions

The study analyzed what type of fairness sub-dimension is mostly addressed by agro-food companies (Table 2). Results support that 41.1% of products indicate that farmers receive a fair price ("Fair Price for Farmers" sub-dimension), and it is the most common within distributive fairness sub-dimension. In addition, 26.1% of products specify the price paid to farmers, and 17.7% of products aim to reassure consumers specifying that they ensure farmers' remuneration that covers production costs (without quantifying it). Some companies provide even more detailed information. They state information on the price share distribution among the other chain actors (40 products), with particular attention on farmers, and with progressively limited information on downstream actors (e.g., processors and retailers). Another fair price sub-dimension, which is about the payment to farmers of a premium price for exceeding the raw material minimum quality standards, is present only in 8% of products.

These results support a good commitment of companies in providing information to consumers and stakeholders about the distributive fairness. They aim to provide transparent information on



TABLE 1 Fair products' characteristics.

Variables	Frequency %
<i>Fairness</i>	
Distributive fairness	56.64
Procedural fairness	92.92
Interactional fairness	96.46
Products with all types of fairness	53.54
<i>Price level</i>	
Equal or below 5 Euros	51.77
Above 5 Euros to equal to 10 Euros	10.12
Above 10 Euros to equal to 15 Euros	3.80
Above 15 Euros to equal to 20 Euros	1.00
Above 20 Euros	20.89
<i>Brand type</i>	
Commercial	76.11
Private	23.89
<i>Company types</i>	
Producer	18.58
Processor	30.09
Association	23.89
Retailer	24.78
<i>Product claims and attributes</i>	
Nutritional and functional claims	8.85
Organic demeter	50.00

The number of products analyzed is 226. Food products may have more than one fairness sub-dimension.

one of the key aspects of fairness that is the outcome recognized to farmers. At times, the outcome is quantified, in others it is communicated with no further details.

In procedural fairness' dimensions, the most provided sub-dimension is cooperation. Results support that 77.4% of products indicate that companies work in close cooperation with their suppliers, and that 59.3% of products provide information on the adopted procedures relating to price distribution. Information on the technology and innovation adopted to favor transparency and trust among chain actors is the least provided among the sub-dimensions in procedural fairness (30.5% of products).

Within interactional fairness, the most common sub-dimension highlights the strong relationship between farmers and other chain actors (69.03% of products). It is followed by information on food processors or retailers approach towards suppliers in terms of politeness, dignity, respect, sharing similar ethical values (65.93%), and trustful relationships with farmers (61%). Few products provide information on the Child-labor sub-dimension (27.4%), as it may be considered a granted practice.

Finally, results support that cooperation between food processors, retailers, and suppliers (10.4%), as well as statements on the strong relationships with farmers (9.2%), the adoption of respectful approach and ethical value sharing with suppliers (8.8%), and the provision of information about the adopted procedures leading to fairer price distribution (7.9%) are the key messages.

Overall, these findings support that processors and retailers mainly give importance to information related to cooperation from procedural fairness, and to relationship between farmers and other chain actors from interactional fairness.

### 4.3. Hierarchical clustering and non-hierarchical clustering (k-means)

The first step of data elaboration applied the Hierarchical Ward's method to establish the number of clusters, followed by the non-hierarchical k-means method to define clusters. Hierarchical Clustering Analysis was performed on brand types and company types (Table 3). Results show that the optimal clusters' number is three. After identifying the optimal clusters' number, k-means from non-hierarchical clustering analysis was used to define the components belonging to each of the three clusters. In particular, Cluster 2 includes 110 products, all commercially labelled, whereas Cluster 1 contains 62 products, including 53 private labelled products. Cluster 1 consists of 56 fair products sold by retailers. Cluster 2 consists of 42 fair products sold by producers and 68 products sold by processors. Cluster 3 groups with 54 products commercialized by associations.

Furthermore, results show that the groups of products in Cluster 1 are mainly promoted by downstream actors such as retailers with private labels. Thus, the cluster was named "Downstream Driven." Cluster 2 includes fair products promoted by producers and processors; hence Cluster 2 is labelled "Upstream Driven" and has mainly commercial label-oriented products. Finally, products included in Cluster 3 are mainly promoted by "Extended Chain Driven" actors such as associations and are mainly commercial label branded products.

Moreover, findings show that interactional fairness stands out in all three clusters. The upstream driven cluster is highly concentrated on interactional fairness (96.36%) followed by procedural fairness (93.64%). Although distributive fairness is less frequent compared to other types of fairness, in extended chain driver cluster it has a higher number of cases compared to downstream and upstream driven clusters (83.34%).

### 4.4. Multinomial logistic regression model

The present section of the study aims to understand if agro-food companies belonging to different clusters along the chain have different relationships with products' characteristics, including fairness dimension, organic, nutritional and functional claims, and price. In consideration of the existing three clusters, the study performed a multinomial logit model to measure the relationships. Logistic regression applied a set of predictors (explanatory variables) to estimate the logit the natural log of the odds [probability/(1-probability)] of an event outcome. Starting with the saturated models (models containing all predictors), the least significant predictors were dropped one by one until the predictors that remained in the models were significantly ( $p$ -value < 0.05) contributing to the model.

Table 4 determines which of the independent variables significantly predicts whether distributive fairness, organic, food price

TABLE 2 Fair products' sub-dimensions.

Fairness sub-dimensions	Fairness sub-dimensions description	Number	Percentage on total (row %—out of 226 products)
	<i>Distributive fairness dimension</i>		
Fair_Price_For_Farmers	Food processors or retailers specify that farmers receive a fair price for their agricultural products	93	41.15
Remuneration_for_Farmers	Food processors or retailers specify the price paid to farmers (Euro/kg, Euro/litre, % farmer remuneration on consumer price)	59	26.11
Farmer_Cost	Food processors or retailers specify that they ensure farmers' remuneration to cover production costs (without quantifying it)	40	17.70
Quantify_price_distribution_information	Food processors or retailers provide information on the price distribution among the chain actors (on labels/website)	40	17.30
-of_Farmers	Farmers	27	11.95
-of_Processors	Processor	22	9.73
-of_Retailers	Retailers	14	6.19
-other value chain actors	Other chain actors	27	11.95
Fair_Price	Food processors or retailers specify that farmers receive a premium price for exceeding the raw material minimum quality standards	18	7.96
	<i>Procedural fairness dimension</i>		
Cooperation	Food processors or retailers specify that they work in close cooperation with their suppliers (e.g., long-term cooperation, product quality agreement with suppliers, price setting criteria, farmer cooperatives, producer—farmer organization, IBO)	175	77.43
Information on procedure	Food processors or retailers provide information about the adopted procedures resulting in agro-food chain price distribution (e.g.: predefined contract, contract farming)	134	59.29
Fair_Trade	The product has a Fairtrade certification	97	42.92
Consumer and no-profit association driven	Fair Product comes from initiative promoting direct link between processors and consumers (Consumer-driven initiative, No-profit association, limited intermediaries)	72	31.86
Technology innovation	Food processors or retailers adopt agro-food chain technology innovation projects to favor transparency and trust among chain actors, including farmers (e.g., blockchain, digital platform, etc.)	69	30.53
	<i>Interactional fairness</i>		
Relationship between farmers and other chain actors	Food processors or retailers specify that they aim for strong relationships with farmers	156	69.03
Politeness	Food processors or retailers specify that they treat their suppliers with politeness, dignity, respect, sharing similar ethical values	149	65.93
Trust	Food processors or retailers specify that they establish trustful relationship with farmers	138	60.96
Labour_Rights-Gangmastering Laws	'Food processors or retailers specify that they are against gangmastering, have a Labor rights certification, support labor rights and wages, workers' working conditions	106	46.9
Benefits for farmers	Food processors or retailers specify that they provide benefits for farmer suppliers (e.g.: selected seeds to farmers, check production processes with farmers, training and social services for farmers, health services for labor, etc.)	103	45.58
Discrimination	Food processors or retailers specify that they guarantee "no discrimination" policy (e.g.: gender, religion, political affiliation, disadvantage people, etc.)	88	38.94
Child_Labour	Food processors or retailers specify that they or their farmer suppliers avoid child labor (e.g.: no child labor certification)	62	27.43

TABLE 3 Fair food product clusters profiles.

	Downstream driven (Cluster 1)	Upstream driven (Cluster 2)	Extended chain driven (Cluster 3)	Total
Number of fair products	62	110	54	226
% of fair products on total	27%	49%	24%	100%
<b>Company types</b>				
Producer	0	19%	0	19%
Processor	00	30%	0	30%
Association	0	0	24%	24%
Retailer	27%	0	0	25%
TOTAL	27%	49%	24%	100%
Pearson chi2(8) = 452.0000, Pr = 0.000; Fisher exact Pr = 0.000; Likelihood-ratio chi2(8): 473.4012, Pr = 0.000				
<b>Brand types</b>				
Commercial	4%	49%	23%	76%
Private label	23%	0	0	24%
TOTAL	27%	49%	24%	100%
Pearson chi2(1) = 183.5781, Pr = 0.000; Fisher exact Pr = 0.000; Likelihood-ratio chi2(2): 196.8583, Pr = 0.000				

Type of fairness						
	Number	% on Downstream driven products	Number	% on Upstream driven products	Number	% on extended chain driven products
Distributive Fairness	24	39%	59	54%	45	83%
Procedural Fairness	57	92%	103	94%	50	93%
Interactional Fairness	59	95%	106	96%	53	98%

are included by the “Downstream Driven (Cluster 1)” or “Extended Chain Driven (Cluster 3)” versus the “Upstream Driven (Cluster 2).” The Upstream Driven cluster was selected as a reference group. In this context, the coefficients for all other outcome groups define how the independent variables are related to the probability of being in that outcome group versus the reference group.

Results support that “Distributive Fairness” is significant in Cluster 1 versus Cluster 2. For each one unit increase on distributive fairness, the likelihood of a product to be included by “Downstream Driven” cluster (relative to the “Upstream Driven” cluster) is predicted to decrease by 0.809 units. The results suggest that fair products promoted by “Downstream Driven” (Cluster 1) are significantly less likely to have distributive fairness compared to “Upstream Driven” (Cluster 2). Food Price “Above 5 Euro” is significant in Cluster 1 versus Cluster 2. For each one unit increase on Food Price “Above 5 Euro,” the likelihood of a product to be included in “Downstream Driven” (relative to the “Upstream Driven”) is predicted to decrease by 2.09 units. Fair products promoted by “Downstream Driven” are significantly less likely to be priced “Above 5 Euro” compared to “Upstream Driven.” The probability of both these variables in “Downstream Driven” is less likely to be in “Upstream Driven.” Although both variables have decreasing effects, food price “More than 5 Euro” effect is much stronger compared to the Distributive Fairness’ effect.

“Distributive Fairness,” Food Price “Below 5 Euro,” and “Organic” are significant in “Extended Chain Driven” (Cluster 3) versus “Upstream Driven” (Cluster 2). For each one unit increase on “Distributive Fairness,” the likelihood of a product to be included by “Extended Chain Driven” (relative to the “Upstream Driven”) is predicted to increase by 1.728 units. The result suggests that fair products promoted by “Extended Chain Driven” are significantly more likely to have distributive fairness compared to “Upstream Driven.” For each one unit increase on “Organic” products, the likelihood of a product to be promoted by “Extended Chain Driven” (relative to the “Upstream Driven”) is predicted to decrease by 1.08 units. Fair products promoted by “Extended Chain Driven” are less likely to be organic compared to “Upstream Driven.” For each one unit increase on Food Price “Below 5 Euro,” the likelihood of a product to be promoted by “Extended Chain Driven” (relative to the “Upstream Driven”) is predicted to increase by 1.43 units. Fair products promoted by “Extended Chain Driven” are significantly more likely to be priced below 5 Euro compared to “Upstream Driven.” The probability of “Distributive Fairness” and Food Price “Below 5 Euro” in “Extended Chain Driven” is more likely to be in “Upstream Driven” category. Although both variables create increasing effect, “distributive fairness” increasing effect is stronger compared to the Food Price “Below 5 Euro.”

TABLE 4 Results of multinomial logistic regressions.

Comparison variables /clusters	Downstream driven (Cluster 1) vs. Upstream driven (reference cluster)			Extended chain driven (Cluster 3) vs. Upstream driven (reference cluster)		
	Coefficient	Std.Err	p value	Coefficient	Std.Err	p value
Distributive Fairness	-0.809	0.369	0.028**	1.728	0.448	0.000***
Procedural Fairness	0.316	0.655	0.630	-0.647	0.791	0.414
Interactional Fairness	-0.697	0.925	0.451	0.842	1.327	0.525
Organic	-0.449	0.354	0.204	-1.080	0.386	0.005***
Nutritional Functional Claims	0.893	0.580	0.124	-1.531	0.854	0.073
Price as More than 5 Euro	-2.094	0.717	0.004***	1.027	0.570	0.07
Price as Equal or below 5 Euro	-0.511	0.387	0.187	1.433	0.473	0.002***
Constant	0.811	1.099	0.461	-2.517	1.467	0.08

Number of observations: 226; Prob > Chi<sup>2</sup> = 0.0000; Pseudo R<sup>2</sup> = 0.1422.

\*\*\*, \*\* refer to statistical significance at the 1%, 5% levels, respectively.

## 5. Discussion

### 5.1. Fairness types in food products commercialization strategies

The main objective of this research is to explore what types of fairness agro-food chain actors value in the food products they commercialize, and if the type of agro-food company has a relation with the type of fairness valued. The issue addressed by the current research has become increasingly relevant in the latest years, mainly due to the economic crises expressed by the farmers and consequent higher public attention on the social and economic unfair practices that characterize the agro-food system.

Currently company strategies and government policies are increasingly investing on ensuring agro-food chain fairness, as a key element of agro-food system sustainability. In this context, food labelling strategies focused on fairness information are becoming more common and may turn into a key competitive tool for agro-food companies. To analyze the issues of fairness in food labelling from an empirical perspective, this article provides a comprehensive literature review in order to conceptualize fairness and then it applies these concepts. Results expands past literature supporting that food labelling is a crucial tool in terms of information sharing and transparency among food chain actors. As highlighted by several authors (Barham, 2002; Grunert, 2005; Conner et al., 2008; Reynolds, 2009; Corallo et al., 2021), food labelling information differ among products and may contain fairness and ethics information. Since the structure and the management practice of the agro-food chains vary, it is crucial to explore how the different food chain actors value the different types of fairness and how this is reflected on their product commercialization strategies.

Past literature identifies three types of fairness and these have been confirmed by the current study. Distributive fairness concerns the distribution of outcomes (Adams, 1965; Duffy et al., 2003; Griffith et al., 2006; Gu and Wang, 2011; Massa and Testa, 2012). Current research results maintain that a limited number of companies tend to provide information on chain actors' remuneration and fair price. Confirming past scholars' findings (Thibaut and Walker, 1978; Griffith et al., 2006; Sun et al., 2018), the current study proves that the conceptualization of fairness is connected also to procedural issues.

Various companies in the food market tend to share information about procedures and relationships between the chain actors. Past research authors (Bies and Moag, 1986; Gu and Wang, 2011; Kashyap and Sivadas, 2012) argue that interpersonal fairness is about respect, dignity, trust in agro-food chain. Many of the food products analyzed share information on the ethics-oriented practices they have adopted with other chain actors. In particular, the current study highlights that the agro-food chain steps companies belong to and the type of brand (i.e., commercial or private) have a relation with the companies' inclination towards fairness practices. The results of this study expanded the limited available information on the relationship between the chain actors and the three types of fairness. Distributive fairness prevails among the upstream actors that is producers and processors, rather than retailers. This outcome confirms the findings of Massa and Testa (2012), which addressed fairness issues focusing on the challenging relation between food retailers, transparency and fair price.

Moreover, results confirm that the Extended Driven cluster is significantly more likely to highlight distributive fairness practices compared to the other clusters. This supports the results of Deresa (2017), which analyzed the role of associations in price stabilization and fair price processes, by establishing an important nexus between distributional issues and cooperatives. Within the present study associations appear to have a positive role in supporting distributive fairness practices in the chain. These results support the findings of Christensen (2015), who addressed the relationship between fairness and chain actors by addressing the role of cooperatives, and highlighting the vital role of consumer associations on fair trade, which is one of the sub-dimensions of the procedural fairness in the present study.

Finally, the findings support the results of several studies about the relevance of fair trade in terms of strategic capabilities and cooperative behaviors among the chain actors (Eshuis and Harmsen, 2003; Hira and Ferrie, 2006; Huybrechts and Reed, 2010; Nicholls, 2010; Nuseva et al., 2014; Coulibaly and Blanchot, 2015; Wang and Chen, 2019; Naegel, 2020). Fair trade labelling relates to bargaining and market power, thus as a procedural fairness sub-dimension. In this perspective, fair trade labelling is an important tool for managing the negotiation processes, which can give companies a relevant competitive power.



## 5.2. Managerial implications

In view of the need to reach a sustainable agro-food system, agro-food managers should deserve close attention to chain fairness issues. This becomes even more critical when we take into account the 2030 Agenda and the Sustainable Development Goals (SDGs), which specifically prioritize food and nutrition security, decent working conditions, and the preservation of terrestrial and marine ecosystems as global imperatives. In this context, food companies play a vital role in not only driving economic growth and business opportunities but also in actively contributing to the overall well-being and environmental sustainability of the food system and societies at large.

By aligning their practices with the principles of fair trade and sustainable development, food companies can positively impact various aspects of society. Ensuring fair wages and decent working conditions for employees, especially in the agricultural sector, can enhance social equity and improve the livelihoods of workers and their families. Moreover, adopting sustainable and environmentally responsible practices helps mitigate the adverse impact of food production and distribution on the planet. By promoting eco-friendly sourcing, reducing waste, and supporting biodiversity conservation, these companies actively contribute to the maintenance and preservation of the ecosystems.

From this perspective, access to fairness information by consumers and companies could contribute to define a company's competitive advantage as well as a crucial role of food companies in ensuring sustainability. To this extent, food labelling and other companies' communication channels can be a tool for sharing information. The agro-food system is characterized by strong competition. Broad information sharing on fairness practices can help position companies in the market. It is therefore important to explore a perspective that can help to define effective fairness-oriented strategies, through the analysis of empirical results.

The research outcomes define a composite agro-food business setting, which reflects the heterogeneity of the agro-food chain actors' management practices. Compared to downstream chain actors, upstream and extended chain actors pay more attention to the distributive fairness, which deals with distributional issues such as fair price. Downstream chain actors place less importance on this aspect. Considering the advantages that information on fairness agro-food chain practices can provide, retailers should also take this aspect into account, and value it within a fairness-oriented managerial competitive strategy.

Furthermore, the fairness-oriented food products with a price higher than 5 euros are more present in the upstream driven cluster. Keeping the prices below 5 euros could be an effective way for farmers and processors to reach consumers of a wider audience. It is advisable to ensure an adequate diversification of the product price ranges, so to ensure companies target a wider consumer audience.

Finally, the results of this research show that various fair products are organic. Companies' management practices valuing sustainability criteria correctly appreciate its multidimensionality that is environmental, such as organic, and economic, such as fairness. In the future stronger attention could be placed on social fairness and nutritional sustainability aspects.

## 5.3. Limitations and further research

In order to acknowledge the value of this study, it is important to recognize its limitations. The first limitation concerns the sample size. It is a wide sample, but given the importance of the phenomenon, future research with a bigger and systematic sample may provide further findings on the significant relationship between the different chain actors and the different types of fairness. The second limitation concerns the lack of past empirical studies about this topic to provide an historical perspective. There are indeed limited studies in past literature on the relationship between fairness types, food labelling and the various agro-food chain actors. This study is actually aimed at filling this gap, but it cannot be exhaustive. Further studies are needed in order to build a solid benchmark for exhaustive analysis. Finally, future studies may carry out consumers' real-time analysis aimed at understanding how food products' fairness attributes may influence consumers' purchasing habits in real world situations.

## 6. Conclusion

This paper explored the relationship between agro-food chain actors and the types of fairness adopted in their commercialized food products. In particular, it examined food labelling information on the issue of fairness approaches in agro-food chain relationships. Food labelling is an important tool to convey information on the relationship between company types and fairness. An informative food label should include elements about whether the product is fair, the type of chain upstream actor who produced it, and market price distribution along the chain. Similarly, sharing information on the companies' websites or in their annual reports is important in order to provide an adequate transparency on the companies' agro-food chain managerial practices. Yet, food labelling remains the easiest way to deliver information about the products to consumers. Furthermore, it can be an important competitive advantage, which companies should take into account.

This paper highlights some important points on the role of fairness in agro-food chain management practices. First, the distributive fairness has a crucial role with respect to the rest of fairness types. Second, extended chain actors, such as associations, compared to the other chain actors, mainly consider distributive fairness. Third, distributive fairness information sharing prevails among upstream chain actors compared to downstream chain actors, such as retailers.

Fairness has the potential to become an important issue in the agro-food systems and the current research highlights its possible consideration among the chain actors. The findings confirm the interest of some companies in sharing information on business strategies focused on fairness. Moreover, the information on the data collection theoretical and methodological criteria applied and provided in the current research study can offer useful analytical methods and tools to further explore these issues. Considering the lack of empirical studies about this topic, the current research can be a first step of a pioneering research area that needs further development. It might also be useful to consider the creation and implementation of a third-party independent certification or label aimed at confirming and defining in detail how fairness is applied

and measured in the agro-food chain industry. The European Union may promote this initiative. It could be an effective tool for ensuring long-term equity, sustainability and transparency along the agro-food chains.

In conclusion, it is crucial to recognize the necessity for additional quantitative investigations to determine the actual effectiveness of fairness claims made by companies. The legitimate concern regarding the risk of greenwashing or ethics-washing practices highlights the importance of conducting extensive and thorough examinations. By conducting further research and empirical studies, it is possible to gain deeper insights into the actual impact of ethical practices in agro-food chains. Rigorous evaluations of social, economic, and environmental practices may identify concrete marketing and management practices, and detect rhetoric tactics. Demonstrating a genuine commitment to fairness-oriented practices would enhance credibility among stakeholders resulting in strengthened agro-food system sustainability.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Author contributions

AS: conceptualization, methodology, validation, supervision, project administration, and writing—review and editing. ZB and AS: formal analysis and data curation. AS, ZB, and AF: writing—original draft preparation. ZB: visualization. AS, GA, AA, IM, AB, AK, and

AG: funding acquisition. AS, AA, IM, SF, ZB, AF, TE, EM, AB, LP, AG, LA, AK, and GA: investigation.

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## Conflict of interest

SF and TE were employed by Ifeu—Institut für Energie und Umweltforschung Heidelberg gGmbH.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## References

- Adams, S. (1965). "Inequity in social exchange" in *Advances in experimental psychology*. Vol. 2. ed. L. Berkowitz (New York, NY: Academic Press).
- Aleman, A.P.F., Herrera, L., and Muñoz-Doyague, M. (2023). Fair trade and the sustainable development goals: an opportunity for sustainable production and consumption. in *Global Challenges for a Sustainable Society. Springer Proceedings in Earth and Environmental Sciences. EURECA-PRO 2022*. Eds. Benítez-Andrades, J.A., García-Llamas, P., Taboada, Á., Estévez-Mauriz, L., Baelo, R. (Springer, Cham).
- Associazione Terra (2021). Gangmastering: The southern question Italy, Spain, Greece. Report of Terra—Riavvia il pianeta.
- Barham, E. (2002). Towards a theory of values-based labeling. *Agric. Human Values* 19, 349–360. doi: 10.1023/A:1021152403919
- Bies, R. J., and Moag, J. S. (1986). Interactional justice: communication criteria of fairness. *Res. Negot. Organ.* 1, 199–218. doi: 10.1007/BF01048016
- Briggeman, B. C., and Lusk, J. L. (2011). Preferences for fairness and equity in the food system. *Eur. Rev. Agric. Econ.* 38, 1–29. doi: 10.1093/erae/jbq033
- Chang, J. B., and Lusk, J. L. (2009). Fairness and food choice. *Food Policy* 34, 483–491. doi: 10.1016/j.foodpol.2009.08.002
- Christensen, C. B. (2015). Two kinds of economy, two kinds of self—toward more manageable, hence more sustainable and just supply chains. *Hum. Ecol. Rev.* 21, 3–21. doi: 10.22459/HER.21.02.2015.01
- Colquitt, J. A., Wesson, M. J., Porter, C. O. L. H., Conlon, D. E., and Ng, K. Y. (2001). Justice at the millennium: a meta-analytic review of 25 years of organizational justice research. *J. Appl. Psychol.* 86, 425–445. doi: 10.1037/0021-9010.86.3.425
- Conner, D., Campbell-Arvi, V., and Hamm, M. W. (2008). Consumer preferences for pasture-raised animal products: results from Michigan institutional procurement view project economic impact assessment toolkit for local food systems view project. *J. Food Distrib. Res.* 39, 1–14. doi: 10.22004/ag.econ.9087
- Co-op (2021). *Ethical Consumerism Report 2021. Can We Consume Back Better?* Manchester: Co-operative Group Limited.
- Corralo, A., Latino, M. E., Menegoli, M., and Pizzi, R. (2021). Assuring effectiveness in consumer-oriented traceability; suggestions for food label design. *Agronomy* 11:613. doi: 10.3390/agronomy11040613
- Coulibaly, M., and Blanchot, F. (2015). "Selecting a certification body in the fair trade market: the importance of strategic capabilities and cooperative behavior" in *The Practice of Behavioral Strategy*, Charlotte, NC: Information Age Publishing, 1–24.
- DeFries, R. S., Fanzo, J., Mondal, P., Remans, R., and Wood, S. A. (2017). Is voluntary certification of tropical agricultural commodities achieving sustainability goals for small-scale producers? A review of the evidence. *Environ. Res. Lett.* 12. doi: 10.1088/1748-9326/aa625e
- Deres, T. K. (2017). Role of consumer cooperative Society in Price Stability in the case of Goh consumer cooperatives Benchi-Maji zone, south west of Ethiopia. *Int. J. Coop. Stud.* 6, 16–24. doi: 10.11634/216826311706708
- Duffy, R., Fearn, A., and Hornibrook, S. (2003). Measuring distributive and procedural justice: an exploratory investigation of the fairness of retailer-supplier relationships in the UK food industry. *Br. Food J.* 105, 682–694. doi: 10.1108/00070700310506236
- Eshuis, F., and Harmsen, J. (2003). *Making Trade Work For the Producers: 15 Years of Fairtrade Labelled Coffee in the Netherlands*. Max Havelaar Foundation, Netherlands.
- Fairtrade Foundation (2021). Monitoring the scope and benefits of fairtrade. Monitoring report, 12th edition. Available at: [www.fairtrade.org.uk/wp-content/uploads/2021/11/2021-Fairtrade-monitoring-report-overview-12th-Ed.pdf](http://www.fairtrade.org.uk/wp-content/uploads/2021/11/2021-Fairtrade-monitoring-report-overview-12th-Ed.pdf)
- Fairtrade International. (2021a). How does fairtrade mitigate human rights violations in global supply chains? Available at: <https://www.fairtrade.ie/wp-content/uploads/2021/04/Fairtrade-Human-Rights-and-the-Environment-What-next...pdf>
- Fairtrade International. (2021b). Fairtrade production overview. Available at: [www.fairtrade.net/impact/fairtrade-production-overview](http://www.fairtrade.net/impact/fairtrade-production-overview)
- Fairtrade International (2022). Building resilience in a changing world. Annual report 2021-2022. Bonn, Germany.

- FAO (2016). *OECD-FAO Guidance for Responsible Agricultural Supply Chains*, OECD Publishing, Paris.
- FAO (2019). *Due Diligence, Tenure and Agricultural Investment—A Guide on the Dual Responsibilities of Private Sector Lawyers in Advising on the Acquisition of Land and Natural Resources*. FAO Legal Guide No. 1. Rome.
- Ferreira-Quilice, T., Hernández-Maestro, R., and Gonzalez Duarte, R. (2023). Corporate sustainability transitions: are there differences between what companies say and do and what ESG ratings say companies do? *J. Clean. Prod.* 414:137520. doi: 10.1016/j.jclepro.2023.137520
- Fiala, V. F., Freyer, B., and Bingen, J. (2021). Environmentally sound agriculture between transformation and conformation: the changing portrayal of the growing organic farming movement in Austria's newspaper coverage. *Environ. Commun.* 15, 495–513. doi: 10.1080/17524032.2020.1866636
- Globescan (2019). *Consumers See Fairtrade as Reflection of Their Personal Values, Based On Fair Prices, Living Income and Improving Farmer Livelihoods*. London: Fairtrade Foundation Commissioned Research.
- Greenberg, J. (1990). Employee theft as a reaction to underpayment inequity: the hidden cost of pay cuts. *J. Appl. Psychol.* 75, 561–568. doi: 10.1037/0021-9010.75.5.561
- Griffith, D. A., Harvey, M. G., and Lusch, R. F. (2006). Social exchange in supply chain relationships: the resulting benefits of procedural and distributive justice. *J. Oper. Manag.* 24, 85–98. doi: 10.1016/j.jom.2005.03.00
- Grunert, K. G. (2005). Food quality and safety: consumer perception and demand. *Eur. Rev. Agric. Econ.* 32, 369–391. doi: 10.1093/eurag/jbi011
- Gu, F. F., and Wang, D. T. (2011). The role of program fairness in asymmetrical channel relationships. *Ind. Mark. Manag.* 40, 1368–1376. doi: 10.1016/j.indmarman.2011.07.005
- Hayes, M. (2006). On the efficiency of fair trade. *Rev. Soc. Econ.* 64, 447–468. doi: 10.1080/00346760601024419
- Hira, A., and Ferrie, J. (2006). Fair trade: three key challenges for reaching the mainstream. *J. Bus. Ethics* 63, 107–118. doi: 10.1007/s10551-005-3041-8
- Hooker, J. (2003). Why business ethics? *The Balanced Company*, 16–53. doi: 10.1093/acprof:oso/9780199255504.003.0002
- Huybrechts, B., and Reed, D. (2010). Introduction: “fair trade in different National Contexts”. *J. Bus. Ethics* 92, 147–150. doi: 10.1007/s10551-010-0574
- Kashyap, V., and Sivasdas, E. (2012). An exploratory examination of shared values in channel relationships. *J. Bus. Res.* 65, 586–593. doi: 10.1016/j.jbusres.2011.02.008
- Liao, T. F. (1994). *Multinomial Logit Models*. Thousand Oaks, CA: SAGE Publications, Inc.
- Loconto, A., and Dankers, C. (2014). *Impact of International Voluntary Standards on Smallholder Market Participation in Developing Countries: A Review of the Literature*. Rome: FAO.
- Luig, B. (2021). Koordination Initiative Faire Landarbeit Unter Mitarbeit: Ruxandra Empen, Katharina Varelmann, Tobias Seitz Layout: Marischka Lutz Grafikdesign V. i. S. d. P. *Industriegewerkschaft Bauen-Agrar-Umwelt Bundesvorstand, Vorstandsbereich Stellvertretender Bundesvorsitzender Finanzen – Forst und Agrar Harald Schaum Olof-Palme-Straße Frankfurt am Main, www.igbau.de*
- Mahoney, L. S., Thorne, L., Cecil, L., and LaGore, W. (2013). A research note on standalone corporate social responsibility reports: Signaling or greenwashing? *Crit. Perspect. Account.* 24, 350–359. doi: 10.1016/j.cpa.2012.09.008
- Marchini, A., Riganelli, C., Diotallevi, F., and Polenzani, B. (2021). Label information and consumer behaviour: evidence on drinking milk sector. *Agric. Food Econ.* 9:8. doi: 10.1186/s40100-021-00177-5
- Massa, S., and Testa, S. (2012). The role of ideology in brand strategy: the case of a food retail company in Italy. *Int. J. Retail Distrib. Manag.* 40, 109–127. doi: 10.1108/09590551211201865
- Murtagh, F., and Legendre, P. (2014). Ward's hierarchical agglomerative clustering method: which algorithms implement Ward's criterion? *J. Classif.* 31, 274–295. doi: 10.1007/s00357-014-9161-z
- Naegel, H. (2020). Where does the fair trade money go? How much consumers pay extra for fair trade coffee and how this value is split along the value chain. *World Dev.* 133:105006. doi: 10.1016/j.worlddev.2020.105006
- Nicholls, A. (2010). Fair trade: towards an economics of virtue. *J. Bus. Ethics* 92, 241–255. doi: 10.1007/s10551-010-0581-3
- Nicholls, A., and Opal, C. (2005). *Fair Trade: Market-driven Ethical Consumption*. Sage, London.
- Nosratabadi, S., Mosavi, A., and Lakner, Z. (2020). Food supply chain and business model innovation. *Foods* 9:132. doi: 10.3390/foods9020132
- Nuseva, D., Dakic, S., and Uzelac, O. (2014). Fair trade business model as a function of sustainable development. In *Conference: Symorg, New Business Models and Sustainable Competitiveness*.
- Overbeek, A. (2019). Examining the efficacy of fair trade and alternative consumption on environmental sustainability and human rights in developing countries. *Consilience* 21, 158–171.
- Raynolds, L. T. (2009). Mainstreaming fair trade coffee: from partnership to traceability. *World Dev.* 37, 1083–1093. doi: 10.1016/j.worlddev.2008.10.001
- Ribeiro-Duthie, A. C., Gale, F., and Murphy-Gregory, H. (2021a). Fair trade and staple foods: a systematic review. *J. Clean. Prod.* 279:123586. doi: 10.1016/j.jclepro.2020.123586
- Ribeiro-Duthie, A. C., Gale, F., and Murphy-Gregory, H. (2021b). Fair trade governance: revisiting a framework to analyse challenges and opportunities for sustainable development towards a green economy. *Discov. Sustain.* 2:58. doi: 10.1007/s43621-021-00063-6
- Rimal, A., and Moon, W. (2005). Perceived risks of Agro-biotechnology and organic food purchase in the United States. In: *Conference paper. Annual Meeting, February 5–9, 2005, Little Rock, Arkansas 35501, Southern Agricultural Economics Association*.
- Samoggia, A., and Beyhan, Z. (2021). Fairness-enabling practices in Agro-food chain. *Sustainability* 14:6391. doi: 10.3390/su14116391
- Samoggia, A., Grillini, G., and Del Prete, M. (2021). Price fairness of processed tomato Agro-food chain: the Italian consumers' perception perspective. *Foods* 10:984. doi: 10.3390/foods10050984
- Statista (2019). Fairtrade international—annual report 2018–19. Available at: <https://www.statista.com/statistics/271354/revenue-of-fair-trade-products-worldwide-since-2004/>
- Statista (2023). Fairtrade Deutschland—Jahres und Wirkungsbericht 2022/23. Available at: <https://www.statista.com/statistics/516727/fair-trade-product-sales-germany/>
- Stranieri, S., Riccardi, F., Meuwissen, M. P. M., and Soregaroli, C. (2021). Exploring the impact of blockchain on the performance of Agri-food supply chains. *Food Control* 119:107495. doi: 10.1016/j.foodcont.2020.107495
- Sun, Y., Liu, Z., and Yang, H. (2018). How does suppliers' fairness affect the relationship quality of agricultural product supply chains? *J. Food Qual.* 2018, 1–15. doi: 10.1155/2018/9313068
- Thibaut, J., and Walker, L. (1978). A theory of procedure. *Calif. Law Rev.* 66:541. doi: 10.2307/3480099
- Toler, S., Briggeman, B. C., Lusk, J. L., and Adams, D. C. (2009). Fairness, farmers markets, and local production. *Am. J. Agric. Econ.* 91, 1272–1278. doi: 10.1111/j.1467-8276.2009.01296.x
- Wang, E. S. T., and Chen, Y. C. (2019). Effects of perceived justice of fair trade organizations on consumers' purchase intention toward fair trade products. *J. Retail. Consum. Serv.* 50, 66–72. doi: 10.1016/j.jretconser.2019.05.004
- Yamoah, F. A., and Yawson, D. E. (2023). Promoting global well-being through fairtrade food: the role of international exposure. *Int. Food Agribus. Manag. Rev.* 26, 243–265. doi: 10.22434/IFAMR2021.0078
- Zamfir, I. (2019). Child Labour: a Priority for EU Human Rights Action, *Briefing, European Parliament*. Available at: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633142/EPRS\\_BRI\(2019\)633142\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633142/EPRS_BRI(2019)633142_EN.pdf)
- Zander, K., and Hamm, U. (2010). Consumer preferences for additional ethical attributes of organic food. *Food Qual. Prefer.* 21, 495–503. doi: 10.1016/j.foodqual.2010.01.006

## Annex 1. Data gathering fiche for fairness sub-dimensions

Fairness sub-dimensions	Fairness sub-dimensions description	
<b>Distributive fairness dimension</b>		
Fair_Price_For_Farmers	Food processors or retailers specify that farmers receive a fair price for their agricultural products	yes/no
Remuneration_for_Farmers	Food processors or retailers specify the price paid to farmers (Euro/kg, Euro/litre, % farmer remuneration on consumer price)	yes/no
Farmer_Cost	Food processors or retailers specify that they ensure farmers' remuneration to cover production costs (without quantifying it)	yes/no
Quantify_price_distribution_information	Food processors or retailers provide information on the price distribution among the chain actors (on labels/website)	yes/no
-of_Farmers	Farmers	yes/no
-of_Processors	Processor	yes/no
-of_Retailers	Retailers	yes/no
-other value chain actors	Other chain actors	yes/no
Fair_Price	Food processors or retailers specify that farmers receive a premium price for exceeding the raw material minimum quality standards	yes/no
<b>Procedural fairness dimension</b>		
Cooperation	Food processors or retailers specify that they work in close cooperation with their suppliers (e.g. long-term cooperation, product quality agreement with suppliers, price setting criteria, farmer cooperatives, producer—farmer organization, IBO)	yes/no
Information on procedure	Food processors or retailers provide information about the adopted procedures resulting in agro-food chain price distribution (e.g.: predefined contract, contract farming)	yes/no
Fair_Trade	The product has a Fairtrade certification	yes/no
Consumer and no-profit association driven	Fair Product comes from initiative promoting direct link between processors and consumers (Consumer-driven initiative, No-profit association, limited intermediaries)	yes/no
Technology innovation	Food processors or retailers adopt agro-food chain technology innovation projects to favor transparency and trust among chain actors, including farmers (e.g. blockchain, digital platform, etc.)	yes/no
<b>Interactional fairness</b>		
Relationship between farmers and other chain actors	Food processors or retailers specify that they aim for strong relationships with farmers	yes/no
Politeness	Food processors or retailers specify that they treat their suppliers with politeness, dignity, respect, sharing similar ethical values	yes/no
Trust	Food processors or retailers specify that they establish trustful relationship with farmers	yes/no
Labour_Rights-Gangmastering Laws	'Food processors or retailers specify that they are against gangmastering, have a Labor rights certification, support labor rights and wages, workers' working conditions	yes/no
Benefits for farmers	Food processors or retailers specify that they provide benefits for farmer suppliers (e.g.: selected seeds to farmers, check production processes with farmers, training and social services for farmers, health services for labor, etc.)	yes/no
Discrimination	Food processors or retailers specify that they guarantee "no discrimination" policy (e.g.: gender, religion, political affiliation, disadvantage people, etc.)	yes/no
Child_Labour	Food processors or retailers specify that they or their farmer suppliers avoid child labor (e.g.: no child labor certification)	yes/no