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Can Creating an Agro-Product Regional Public Brand Improve the Ability of Farmers to Sustainably Increase Their Revenue?

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Abstract: Through the analysis of various typical cases, this study examines whether the establishment of an agro-product regional public brand (ARPB) can effectively boost the revenue of farmers and increase their share in the supply chain. The findings suggest that an early-stage ARPB can command a price premium for products, yet its overall contribution to farmers' revenue remains limited due to scale constraints. The premium ability of an ARPB is influenced by product characteristics and sales strategies, underscoring the need to enhance control over terminal sales. Although the revenue of all operators in an ARPB supply chain shows an increase compared to that of a non-ARPB supply chain, the ratios of revenue allocated to farmers diminish. The Shapley value method was utilized to optimize the revenue-sharing in the supply chain, indicating a need to increase the share of revenue for farmers. This optimization necessitates the formation of a community of interests between farmers, processing enterprises, and sellers to facilitate the upstream movement of brand premiums. Furthermore, enhancing the government's mediation and regulatory functions can provide farmers with more opportunities to partake in brand benefits.

Keywords: agro-product regional public brand; brand premium; cost benefit; revenue-sharing

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1. Introduction

With the development of China's economy, the gap between urban and rural areas continues to widen, bringing attention to the development issues of 'agriculture, rural areas and farmers'. The 'National Agricultural Sustainable Development Plan (2015–2030)', jointly issued by the Ministry of Agriculture and eight other ministries and commissions, highlights major challenges facing the sustainable development of China's agriculture. These include the over-exploitation of agricultural resources; excessive use of inputs; ineffective control of agricultural pollution; serious aging of the agricultural labor force; and problems such as high production costs, low revenue, and weak competitiveness. Agricultural operating income growth remains sluggish. As highlighted in the 2023 'Statistical Bulletin of National Economic and Social Development' by the National Bureau of Statistics, the current rural permanent population represents 33.84% of the total population, and urban and rural residents have an income ratio of 2.39, reflecting a significant urban–rural income disparity. Farmers' households derive 34.63% of their income from net operating income, with over 60% originating from agricultural operations, underscoring the continued importance of agricultural production as a livelihood for many farmers. However, the current level of agricultural industrialization is not high, farmers' organization is still at a low level, the growth rate of farmers' income has slowed down, agricultural operating income growth is weak, and there is competition between small farmers and large-scale commercial capitalists, leading to a weakened momentum in income growth. A long-term mechanism for increasing the revenue of farmers has not been established yet. Detailed data can be found in the Supplementary Materials section.Determining how to promote the sustained growth of farmers' income is the core of the issues of 'agriculture, rural areas and farmers', it is also the focal issue of this paper.

The quality of crop and livestock products is often obscured, but geographical certification or branding can effectively showcase and safeguard their unique characteristics. Numerous studies, both domestic and foreign, have demonstrated that geographical indications (GIs) help reduce information asymmetry in agri-food transactions, allowing consumers to more easily discern the origin and quality distinctions of these products. This increased transparency builds consumer trust and willingness to pay more [1–4]. Most studies analyze GI preferences and willingness to pay from the consumer's perspective, using labeling tools to better connect with the market, expand market share, and increase farmers' income [5–7]. A few studies have analyzed the impact of GI on farmers' production behavior from the perspective of producers, thereby increasing the added value of agricultural products [8,9].

The consensus across all sectors of society is that the advancement of agricultural branding is beneficial not only for improving the sustainable development of agriculture but also for increasing farmers' income [10–12]. Since 2006, the Ministry of Agriculture of China has advocated for the promotion of agricultural branding. Subsequently, the No. 1 central document of the Central Committee has consistently highlighted the strategy of 'strengthening agriculture by brand'. In recent years, governments nationwide have implemented policies to support the development of agro-product regional public brands (ARPBs). An ARPB relies on the unique natural and cultural resources within a region and carries out branding operations based on geographical indications to shape a positive regional image and establish a strong product reputation. By obtaining ARPB authorization, various business entities in a region are able to produce products in accordance with standardized brand requirements, resulting in mutual benefits. These brands are characterized by their regional focus, dependence on local resources, shared utilization, and involvement of multiple operators [13–16]. A successful regional brand should integrate agricultural industry resources in the region, guide producers to prioritize product quality and safety, adhere to unified standards in production, and promote the growth of sustainable and environmentally friendly agriculture. This approach will ultimately further increase farmers' income [17,18].

ARPBs differ from private brands as they are shared. During the initial stages of brand development, government guidance and promotion offer significant advantages for establishing a strong presence in the market. Local governments support industry associations by setting up brand development centers or state-owned enterprises to oversee brand operations. This includes creating strategic plans for brand development, managing brand authorization, setting production standards, increasing brand promotion efforts, and ensuring market supervision [19–21]. ARPBs can enhance the market competitiveness of regional products by emphasizing their unique regional characteristics. This transformation shifts competition from being solely between products to among production areas and stimulates regional economic development [22–24].

ARPBs are defined by their reliance on local resources and the involvement of multiple stakeholders. To establish an ARPB, it is essential to have close collaboration across various stages including farming, processing, and sales [25,26]. The foundation lies in the planting and breeding process, with consumers showing keen interest in the farming methods and growth environment of crop and livestock products. Consumers prioritize the origin of products and are willing to pay more for labeled products with ensured safety [27,28].

Based on the background analysis provided, this study proposes the hypothesis that establishing an ARPB can enhance farmers' income-generating potential. This enhancement is evident not only in the growth rate of farmers' income but also in the rise of farmers' revenue share in the supply chain. However, the process of brand building may lead to higher production costs and often results in unequal distribution of supply chain benefits [29–31]. The practical significance of this study lies in verifying whether the terminal premium can be effectively passed on to farmers, increase the price of primary crop and livestock products, and ultimately boost the income of farmers. This perspective needs to be examined from the viewpoint of producers.

In China, ARPBs have been gradually emerging since 2018, prompting scholars to delve into the connotations and characteristics of such brands. The extensive research findings on geographical indications, both domestically and internationally, offer valuable insights for exploring ARPBs. Recent studies have shifted focus towards the growth trajectories, management models, interplay between regional and corporate brands, brand impact, enhancement of competitiveness, and evaluation of brand value in the context of ARPBs. While there is ample research on the creation process of ARPBs, there is a noticeable dearth of studies examining the post-construction effects. The existing literature predominantly adopts a management perspective, with limited economic analysis; qualitative analyses prevail over quantitative ones. This study, grounded in the attributes of resources, public utility, and multiple stakeholders, validates the efficacy of ARPBs and delves into the issue of brand value distribution, serving as a valuable addition to current research.

This paper employs case analysis and actual survey data to examine the influence of ARPBs on farmers' revenue; the following objectives are proposed:

- Compare the price variance between ARPB and non-ARPB products within the same timeframe, focusing on the price differences in the planting (breeding). Assess whether ARPBs have the potential to enhance farmers' income. Additionally, combined with the production scale of ARPB products, evaluate the contribution rate of premium to the overall planting (breeding) households in the region.
- Calculate the costs and benefits of ARPB and non-ARPB products throughout each operator in the supply chain. Determine the percentage of net revenue contributed by each supply chain operator to the total revenue. Assess the influence of regional brands on farmers' net revenue and investigate shifts in the revenue share of farmers. This analysis aims to assess the potential of regional brands in enhancing farmers' capacity to sustainably increase their earnings.
- Utilize the Shapley value method to re-evaluate the revenue share within the ARPB supply chain, enabling a comparison with the previous revenue-sharing structure, and explore a reasonable share plan.
- Propose suggestions to promote the development of ARPBs and effectively improve the ability of farmers to increase revenue.

With the objective of meeting these goals, this paper commences by providing a detailed description of the study area's context and representativeness, as well as the selection of suitable cases and comparison objects. It then outlines the data collection methods and the process for assessing the effectiveness of an ARPB. The study's findings are presented, followed by a discussion of the conclusions, limitations, and recommendations.

2. Materials and Methods

2.1. Description of the Study Area

Inner Mongolia, with its vast territory, exhibits significant differences in natural conditions between its eastern and western regions. Each region showcases unique characteristics in crop and livestock production. According to the official website of the Inner Mongolia Autonomous Region Government, the region serves as a crucial crop and livestock product production hub in China, with mutton production leading the nation. Various mutton sheep breeding models have been established, including grass-fed grazing and grain-fed captive breeding [32]. Additionally, Inner Mongolia is recognized as one of China's 13 major grain-producing areas and 8 large-scale grain-exporting provinces, ranking sixth in grain output nationwide. The region's strong agricultural industry foundation has set a solid groundwork for the development of Inner Mongolia's ARPBs. Since 2018, different areas in Inner Mongolia have been proactively developing ARPBs. These brands include both single-industry brands like 'Hinggan league rice' and 'Xilingol's Sheep', as well as comprehensive-industry brands such as 'Health Talks'. These brands are representative brands in the eastern, central, and western regions of Inner Mongolia.

According to the official website of the local government, Xilingol League is predominantly covered by grassland, accounting for 89.85% of its total area, making it the leading

region in the country in terms of herbivorous livestock [33]. The 'Xilingol's Sheep' brand exemplifies grazing sheep in the region. Bayannur City, situated in the Yellow River Basin, boasts being the largest self-flowing irrigation area in Asia, with rich agricultural and animal husbandry resources. It serves as a significant commodity grain and oil production base in the country. Under the 'Health Talks' brand, a variety of products such as brewing products, meat, flour, dairy products, stir-fried goods, and fresh fruits and vegetables are offered, with lamb being one of these. The 'Health Talks' represents grain-fed sheep raised in captivity. Positioned in the golden rice planting belt in the cold region at 46° north latitude, Hinggan League is a key rice production base in China. The regional brand 'Hinggan league rice' was officially introduced in 2018. Detailed data can be found in the Supplementary Materials section. This study delves into the issue of increasing income for farmers through the aforementioned cases.

2.2. Data Collection

This study compared grass-fed and grain-fed sheep products through 'Xilingol's Sheep' and 'Health Talks' and then compared grain and meat products through the analysis of 'Hinggan league rice'. It calculated the price premium of regional brand products and the cost–benefit of each link in the supply chain and further explored the revenue changes of farmers and the sharing of supply chain benefits [34]. To ensure the comprehensiveness of this research, the case selection included both single-industry and comprehensive-industry ARPBs, as well as crop and livestock products.

The information and data were gathered through two main channels: the first method involved querying the official website for online literature, department documents, and statistical data to provide a better description of the research area. The second method included conducting field surveys by designing questionnaires and interview outlines and gathering relevant data and information through interviews. This study focused on the costs and benefits associated with planting (breeding), processing, and sales in the product supply chain. The data and information required for this study were part of the funded project's content, intertwined with all the project's data and information. The following survey sample was the overall survey situation of funded projects.

In order to complete the project, the research team conducted fieldwork in Hinggan League, Xilingol League, and Bayannur City during the period from 2021 to 2023. Initially, we conducted visits to multiple departments including agriculture and animal husbandry bureaus, market administrations, industry associations, and ARPB operation guidance offices. We carried out semi-structured in-depth interviews with 32 key stakeholders to comprehensively understand the current status of regional brands. This enabled us to clarify the operational management model and partnership of each brand, as well as the role of the government in it. These insights not only served as foundational material for our paper but also facilitated the validation of our research data.

Secondly, we designed a questionnaire for a survey. Due to the needs of different projects, the research team investigated the research area multiple times. A total of 685 households were surveyed and visited across various regions, which included 206 ARPB-traceable order households, cooperatives, and farms. Additionally, 72 crop and livestock product-processing enterprises were visited, with 15 of them being ARPB-authorized enterprises. Furthermore, there were 42 exclusive stores and supermarkets.

The development of ARPBs in Inner Mongolia began in 2018, and the survey concluded in August 2023. The data analysis in this paper primarily focused on the situation in 2022. Due to COVID-19 prevention measures, researchers were unable to conduct general surveys or randomly sample participants; we were guided by local Agriculture and Animal Husbandry Bureau staff to visit survey targets. This paper did not require extensive quantitative statistical analysis with large sample sizes, more suitable for a case analysis paradigm. The focus was on ensuring the comparability of samples. It was essential to carefully select horizontal-comparison samples to analyze the price and cost differences between regional and non-regional brand products. For instance, when choosing farmers

for this study, it was important to select samples with comparable planting and breeding scales as well as similar geographical locations. Similarly, when comparing processing enterprises and sellers, it was important for this study to involve similar non-authorized products from the same company or comparable products from other non-authorized enterprises under similar conditions.

2.3. Data Analysis Procedures

The price premium of a product is a significant factor in boosting revenue [35]. Evaluating the price premium of an ARPB can be challenging. Firstly, many ARPBs in China have only been established recently, and it may take several years for the income-boosting impact to become evident. Secondly, the collaboration between regional brands and corporate brands through co-branded logos complicates the assessment of their individual contributions to revenue growth. Moreover, primary products undergo processing and transformation into various end products with different forms and processing levels, resulting in an inherent added value increment process that makes isolating the price premium attributed to an ARPB difficult. Additionally, fluctuations in product prices due to factors like the epidemic and subsidy policies in recent years have made it challenging to accurately track price trends. Therefore, it is difficult to compare the changes before and after brand building, and only horizontal comparisons can be made between similar products in the same period: (1) a comparison of similar non-ARPB products to measure the price premium of regional brand products; (2) an investigation of different ARPB and non-ARPB products, calculating the cost and benefits of each operator in the supply chain, comparing their net revenue, and analyzing the total revenue-sharing structure.

2.3.1. Regional Brand Premium Calculation Indicators

This study establishes the calculation formula for the regional brand premium rate as

$$ARP = \frac{\sum_{i=1}^{\mathrm{n}} \left(\frac{RP_i - P_i}{P_i}\right)}{\mathrm{n}} \times 100\% \quad (1)$$

ARP represents the average premium rate of regional brand products, RP_i is the price of regional brand products, P_i is the price of similar non-ARPB products, and n is the number of farmers or the number of product types.

Brand premium is categorized into explicit and implicit types [35]. Explicit premium refers to the higher price of brand products compared to others, while implicit premium relates to increased sales quantity. This study examines not only fluctuations in product prices but also changes in sales to determine the ARPB premium contribution rate. This rate is calculated by multiplying the regional brand product premium rate ARP by its sales volume ratio, providing an assessment of the real impact of premium products on the operator's overall income. The calculation formula can be represented as follows:

$$CT\mathrm{r} = ARP \times \frac{Q_B}{Q} \times 100\% \quad (2)$$

CT_r represents the premium contribution rate of $ARPB$, Q_B indicates the output of regional brand products, and Q is the total output.

2.3.2. Accounting Method for Revenue-Sharing Structure in Supply Chain

The establishment of an ARPB will not only impact product prices but also lead to changes in input costs. An increase in price does not always result in higher revenue. It is crucial to consider fluctuations in production costs to determine if farmers have experienced a rise in net revenue [36]. It is also necessary to calculate the net revenue of processing enterprises and sellers, so as to clarify the revenue-sharing structure of the supply chain, compare with non-ARPB products, and analyze changes in the ARPB structure.

The cost–benefit accounting method for mutton sheep breeding and japonica rice planting is determined according to China's 'Compilation of Cost and Benefit Data of Agricultural Products'. The total cost is divided into production cost and land cost, with production cost consisting of direct and indirect costs. This study specifically focuses on comparing direct costs. The direct costs associated with mutton sheep breeding involve expenses such as acquiring young animals (excluding self-breeding), feed, fuel, power, water, maintenance, mortality, disease prevention, and technical services. Similarly, the direct costs of rice cultivation typically encompass expenses related to seedling cultivation or purchase, land preparation, transplanting, fertilization, pest control, weeding, harvesting, and irrigation. Labor costs within direct expenses are categorized into hired labor costs or discounted household labor, with household labor costs being standardized at the average labor cost. Moreover, land expenses comprise land rental fees or self-cultivation discounts, with the latter being calculated based on local average land rental rates. Income is primarily classified into main product revenue and by-product revenue, with this study focusing on main product revenue.

The direct costs of the processing mainly consist of raw material procurement fees, processing fees, inspection and quarantine fees, maintenance and miscellaneous fees, warehousing fees, and fixed asset depreciation fees. The processing fees encompass labor costs, packaging costs, water and electricity costs, sewage fees, and processing losses. The income from the processing comprises sales revenue from various types of finished products.

Different sales channels present varying cost–benefit scenarios. This study primarily examines two sales models: offline direct retail and supermarkets. Offline direct-operated stores typically incur costs such as rent, utilities, internet, packaging, upkeep, staffing, warehousing, transportation, and asset depreciation. On the other hand, selling products in supermarkets involves fees like entry fees, terminal fees, stocking fees, direct marketing fees, year-end rebates, gross profit compensation fees, and replacement fees for perishable items. Revenue generated from sales encompasses income from various product sales.

To calculate the net revenue of each operator in the supply chain, the total revenue of the supply chain, and the revenue-sharing ratios in each operator, the calculation formula can be expressed as

$$\begin{aligned} NP_i &= R_i - C_i \\ TNP &= \sum_{i=1,2,3} NP_i \\ SP_i &= \frac{NP_i}{TNP} \times 100\% \end{aligned} \tag{3}$$

NP_i represents the net revenue of each operator, R_i stands for direct income, C_i represents direct cost, TNP is the total revenue of the supply chain, and SR_i indicates the revenue-sharing ratios of each operator. Here, i = 1, 2, 3, representing farmers (cooperatives), processing enterprises, and sellers, respectively.

2.3.3. Optimization Method for Revenue-Sharing Structure in Supply Chain

Establishing an ARPB necessitates a harmonious and mutually beneficial relationship throughout the supply chain. The key to fostering this collaboration lies in the equitable sharing ratio of brand value added. The Shapley value method is commonly employed to address revenue-sharing issues within the supply chain, ensuring that the earnings of alliance members align with their respective contributions [37–39]. By employing this method, the contributions of farmers in the ARPB supply chain can be evaluated in a more systematic manner, thereby ensuring that farmers can fairly share the new revenue of the brand. The Shapley value method assumes that the set of cooperative operators is I = {1, 2, 3,. . .n}. When each operator i works independently, their revenue is $v(i)$. If they participate in any form of cooperation, they will receive revenue X_i. A cooperative subset S can be formed by any combination of n operators, and $v(s)$ represents the maximum benefit obtained by the cooperative alliance S. When cooperation goals are aligned and non-confrontational, the increase in cooperative members does not lead to a decrease in revenue. Therefore, the cooperation of all members will result in maximizing the

revenue $v(I)$. Revenue distribution using the Shapley value method should satisfy the following conditions:

The maximum benefit of the cooperation as a whole is equal to the sum of the benefits obtained by each participant, reflecting overall rationality.

$$\sum_{i=1}^{n} X_i = v(I), i = 1, 2, \ldots n \tag{4}$$

There exists a Pareto-optimal allocation rule within the cooperation, ensuring that each participating member receives benefits that are greater than or equal to what they would receive from operating alone. This means that participants must benefit from cooperation, ensuring individual rationality.

$$X_i \geq v(i) \tag{5}$$

The sum of the benefits obtained by all cooperation is better than the benefits obtained in sub-alliance S so that the stability of cooperation can be maintained.

$$\sum_{i \in s} X_i \geq v(s) \tag{6}$$

There are various solutions available for a cooperative game involving multiple participants. The key to solving the revenue distribution problem lies in obtaining a more rational and distinct solution. In the Shapley value method, the distribution of revenue acquired by the cooperative parties is recorded as

$$\varphi(v) = [\varphi_1(v), \varphi_2(v) \ldots, \varphi_n(v)] \tag{7}$$

$$\varphi_i(v) = \sum_{s \in S_i} w(|s|)[v(s) - v(s \backslash i)], i = 1, 2, \ldots n \tag{8}$$

$$w(|s|) = \frac{(n - |s|)!(|s| - 1)!}{n!} \tag{9}$$

In the above formula, $|s|$ represents the number of participants in subset s, n is the total number of participants in set I, and $w(|s|)$ is the weighting factor. $v(s)$ denotes the benefit of subset s, $v(s \backslash i)$ refers to the benefit of subset s without member i, and $v(s) - v(s \backslash i)$ represents the contribution member i makes in cooperation s. There are a total of $(n - |s|)!$ $(|s| - 1)!$ ways of cooperation, each with a probability of occurrence denoted by $w(|s|)$, resulting in a unique Shapley value $\varphi_i(v)$.

3. Results

3.1. Price Premium of Regional Brand Products

3.1.1. Price Premium for Regional Brand Sheep Carcasses

In 2022, the 'Xilingol's Sheep' regional brand had four authorized processing enterprises, primarily focusing on free-range grass-fed sheep products. To secure a stable sheep source, an authorized enterprise enters into individual contracts with herdsmen (cooperatives), mandates the use of ear tags on sheep, and commits to purchasing sheep carcasses at a price exceeding the market rate by 1 CNY/kg. By the year's end, 193,400 traceable sheep were procured and processed, with 7.08 million mutton sheep being sold within the League. The regional brand sheep constituted a mere 2.73% of the local mutton sheep sold. The average purchase price of local mutton carcasses in 2022 stood at 72 CNY/kg. Compared with herdsmen who have not signed a contract, the premium rate for herdsmen selling sheep carcasses is 1.4%. For the entire League, the premium contribution rate is only 0.038%.

The 'Health Talks' brand's authorized enterprises have implemented an integrated business model that encompasses the breeding, slaughtering, and processing of Hu sheep. All sheep are sourced from the large-scale breeding farms of the group company. The farm

follows a 'self-breeding, self-fattening, and self-supporting' model to complete the breeding and fattening of Hu sheep before handing them over to the slaughtering and processing enterprises. Once the products are sold, the group headquarters will allocate funds as needed. To alleviate the financial pressure and risks of breeding, authorized enterprises incentivize farmers to purchase Hu Sheep ewes and then repurchase their lambs at a price CNY 100 per lamb higher than that of other sheep breeds. While farmers perceive a price premium in Hu sheep breeding, this is not a brand premium but rather a result of the Hu sheep breed and the company's strategic approach. From the breeding farm's perspective, the price premium in the breeding process cannot be calculated.

In 2022, the price difference for purchasing free-range grass-fed sheep versus captive grain-fed sheep is estimated to be around 14 CNY/kg, with grass-fed sheep priced 24% higher than grain-fed sheep. During that year, Xilingol League produced approximately 107,000 tons of mutton, while Bayannur City produced 196,000 tons, resulting in an output ratio of 0.546. The actual premium for grass-fed sheep over grain-fed sheep was calculated to be 13.1%.

3.1.2. Price Premium for Regional Brand Rice

In recent years, Hinggan League has maintained a stable rice output of over 700,000 tons, representing 59.49% of Inner Mongolia's total rice production. In 2022, there were 54 rice processing enterprises in Hinggan League, with 37 authorized enterprises representing approximately 80% of the league's output, and green or organic rice processing makes up 74% of the league's total output. All regional brand products are green or organic rice, and all organic rice is sourced from the farms of authorized enterprises. The majority of green rice comes from these farms as well, with a small portion sourced from cooperative farmers.

Prior to the establishment of the 'Hinggan league rice' brand, 60% of the local rice was procured by the 'Wuchang Rice' manufacturer in Heilongjiang Province. The competition between these two brands has led to an increase in rice prices. There are many varieties of rice in Hinggan League. The yield and milled rice rates of different varieties vary, leading to different prices. For instance, the Longyang 16 variety saw an average purchase price of 3 CNY/kg for ordinary rice (non-green organically grown rice) in comparison to the same period in 2019, marking a 6.7% price increase; green-grown rice averaged 3.6 CNY/kg, reflecting a 12.5% price hike; and organically grown rice was priced at 6 CNY/kg on average, showing a 12.9% increase. In 2022, green rice was priced 0.6 CNY/kg higher than ordinary rice, representing a 20% price premium, and the contribution rate of regional brands was 14.8%. Organic rice, on the other hand, was priced 3 CNY/kg higher than ordinary rice, a price premium of 100%. Compared to green rice, organic rice was priced 2.4 CNY/kg higher, a price premium of 66.7%. Organic rice, with lower output, is primarily marketed as gift box products. This study focuses on the regional brand green rice. Table 1 lists the price premium and contribution rate of each ARPB relative to the comparison object.

Table 1. ARPB products' price premium and contribution rate (unit: CNY/kg,%).

ARPB	Product Features	Comparing Products	Brand Premium CNY/kg	Premium Rate %	Premium Contribution Rate %
Xilingol's Sheep	grass-fed traceable sheep	grass-fed sheep	1	1.4	0.038
		grain-fed sheep	14	24.0	—
Health Talks	grain-fed Hu sheep	grain-fed Hu sheep	0	0	0
		grain-fed Small-Tailed Han sheep	3.63	6.23	—
Hinggan league rice	green-grown rice in 2022	green-grown rice in 2019	0.4	12.5	—
		ordinary rice in 2022	0.6	20	14.8

3.2. Cost and Benefits of Each Link in the Supply Chain

Solely focusing on the fluctuations in prices of ARPB products may not accurately represent operators' revenue growth [26]. It is crucial to conduct a thorough analysis of the changes in cost benefits as well. Farmers' ability to increase their revenue is not just about earning more money, but also about increasing their proportion of sharing brand value in the supply chain [40].

3.2.1. Cost and Benefits of Each Link in the Mutton Supply Chain

The 'Xilingol's Sheep' brand's authorized enterprises place orders with herdsmen, with the company and the local Agriculture and Animal Husbandry Bureau responsible for purchasing, tagging, and entering data on ear tags. Order herdsmen do not incur additional costs compared to other herdsmen. Authorized enterprises purchase sheep with ear tags at a premium price of 1 CNY/kg, organizing separate batches for slaughtering and processing; only these products are permitted to use regional brand trademarks. The increased cost of 1.18 CNY/kg is primarily due to sheep source tracing, price hikes in procurement, and additional expenses related to product packaging. Apart from these costs, the processing of the products does not differ significantly from similar products within the enterprise.

The brand's products are mainly distributed through two channels: the company's original sales channels and the brand's exclusive e-commerce flagship store. The original sales channels include bulk sales and self-operated terminal retail. Self-operated terminal retail consists of exclusive stores, catering companies, and e-commerce flagship stores. In 2022, around 60% of 'Xilingol's Sheep' products were sold in bulk, while the remaining were sold by direct retail; online retail accounted for a very small proportion. However, bulk sales of regional brand products do not command a price premium compared to other similar products. The factory price for direct retail is set to increase by 2 CNY/kg.

All main products of the authorized enterprises fall within the scope of 'Health Talks' authorization; horizontal comparisons can only be made with products of other local unauthorized enterprises of similar scale. The 'Health Talks' brand's authorized enterprises have implemented integrated operations of breeding, slaughtering, and processing. As a result, there are no additional breeding and procurement costs compared to before using regional brands. However, refined processing has led to increased labor and packaging costs for regional brand products, resulting in more losses. 'Health Talks' brand products are distributed through the original channels of authorized enterprises, with 90% of the products still being sold in bulk, failing to achieve a significant price premium. In 2022, the exclusive stores operated by authorized enterprises just started trial operations, with minimal sales. Alternatively, products are sold through regional brand flagship stores, primarily focusing on gift box packaging products, with mutton products accounting for only 5% to 10% of all product sales in the store. Since other local unauthorized enterprises have not opened exclusive stores, sales can only be compared with the supermarkets.

Following the processing of sheep, a variety of products are derived, categorized into meat products, bone-in products, and head and foot offal products. Grass-fed sheep generally have a lower meat yield, with pure meat products making up only 30% by weight, whereas grain-fed sheep have a higher yield at 40%. Prior to reaching supermarkets, products undergo wholesale transactions ranging from Level 2 to Level 3, resulting in a price increase of approximately 10 CNY/kg from the ex-factory price. Half of this increase is the collective profit for wholesalers across all levels. Although the sales cost in supermarkets is lower compared to direct-operated stores, the profit margins are also reduced. Generally, the profit amounts to 4 CNY/kg after deducting costs. Considering the earnings of wholesalers at all levels, the total net revenue throughout the sales process after factory departure sums up to around 9 CNY/kg.

Table 2 outlines the cost–benefit analysis between regional brand and non-regional brand products in the supply chain, focusing on exclusive sales comparisons. In cases where exclusive sales are not applicable, bulk sales (supermarkets) are used as an alternative. 'Other grass-fed' pertains to similar products not affiliated with the 'Xilingol's Sheep' brand,

while 'Other grain feed' refers to products outside the 'Health Talks' brand. Research data from 2022 indicate that the average carcass weight of grass-fed sheep is 15 kg per head, with an average purchase price of 72 CNY/kg. Conversely, grain-fed sheep have an average carcass weight of 27.5 kg per head, with an average purchase price of 58 CNY/kg.

Table 2. Cost and benefits of each link in the mutton supply chain (unit: CNY/kg).

Link	Project	'Xilingol's Sheep' (Exclusive Sales)	'Other Grass-Fed' (Supermarket Sales)	'Health Talks' (Exclusive Sales)	'Other Grain Feed' (Supermarket Sales)
Breeding	Cost	44.2	44.2	34.8	47
	Revenue	73	72	34.8	58
	Net revenue	28.8	27.8	0	11
Processing	Cost	79.18	78	40.65	63.48
	Revenue	86	84	70	68
	Net revenue	6.8	6	29.4	4.52
Sales	Cost	89	90.5	71.8	74.5
	Revenue	112	99.5	86	83.5
	Net revenue	23	9	14.2	9
Supply chain total revenue		58.6	52.8	43.6	24.52

3.2.2. Cost and Benefits of Each Link in the Rice Supply Chain

Rice planting methods are typically categorized into three methods: ordinary planting, green planting, and organic planting. While the cost of green organic cultivation is higher than that of ordinary cultivation, the yield is often lower. The cost disparity is primarily due to manual weeding and the use of organic fertilizers in green organic planting. While the processing cost of different types of rice may not vary significantly, the milled rice rates do differ. It is important to convert the cost per kilogram of rice based on the specific milled rice rate being used. The packaging of different grades of rice varies significantly. Organic rice is typically packaged in gift boxes, which incurs higher packaging costs. Green rice is often packaged in vacuum-sealed packaging. This study uses a 5 kg vacuum-packed green rice as a case for analysis. On the other hand, ordinary rice is typically packaged in 10–25 kg plastic bags, offering a lower cost option.

In 2022, a few authorized enterprises collaborated to establish 'Hinggan league rice' exclusive stores, but sales were modest. The majority of regional brand rice continues to be sold through the company's existing sales channels, representing approximately 80% of all regional brand rice sales. Table 3 compares the costs and benefits of selling regular rice versus regional brand green rice, using exclusive stores and supermarkets as case examples. Furthermore, transporting costs are contingent on the distance of sales. This study conducts an analysis based on transportation to the capital city of Inner Mongolia.

Table 3. Cost and benefits of each link in the rice supply chain (unit: CNY/kg).

Link	Project	Exclusive Sales		Supermarket Sales	
		Ordinary Rice	Regional Brand Rice (Green Planting)	Ordinary Rice	Regional Brand Rice (Green Planting)
Breeding	Cost	2.4	2.74	2.4	2.74
	Revenue	3.2	3.8	3.2	3.8
	Net revenue	0.8	1.06	0.8	1.06
Processing	Cost	5.06	7	5.06	7
	Revenue	6.42	9.5	6.42	9.5
	Net revenue	1.36	2.5	1.36	2.5

Table 3. *Cont.*

Link	Project	Exclusive Sales		Supermarket Sales	
		Ordinary Rice	Regional Brand Rice (Green Planting)	Ordinary Rice	Regional Brand Rice (Green Planting)
Sales	Cost	7.7	9.64	8.47	10.41
	Revenue	9	14	9	14
	Net revenue	1.3	4.36	0.53	3.59
Supply chain total revenue		3.46	7.92	2.69	7.15

3.3. Supply Chain Revenue-Sharing Structure

Based on the cost–benefit analysis of the cases mentioned above, focusing on authorized enterprises, various collaboration models among operators in the ARPB supply chain can be categorized into the following types [15]: (1) The order mode means that processing enterprises determine transaction relationships with upstream and downstream operators through orders [41,42]. In pastoral areas where the number of sheep is limited and slaughter times are concentrated, the 'Xilingol's Sheep' brand's authorized enterprises often sign agreements with herdsmen to stabilize the sheep source. During peak slaughtering seasons, processing companies sign orders and sell in bulk to expedite payment collection. Similarly, 'Hinggan league rice' authorizes companies to purchase rice and sign orders with farmers; the product sales are also conducted through bulk order signings. (2)The forward integration refers to processing enterprises entering into agreements with farmers to buy sheep or rice, while product sales are conducted through exclusive direct-operated stores. This approach allows for the internalization of sales terminal profits by managing sales activities downstream in the supply chain [43]. Authorized processing enterprises of regional brands expand their industrial chain by engaging in direct terminal sales and proactively participating in the market [44]. (3)The backward integration involves enterprises extending their industrial chain upwards by establishing farms, controlling upstream costs, internalizing upstream profits, and maintaining order cooperation with downstream sellers [45–47]. For instance, authorized enterprises in 'Health Talks' benefit from backward integration by ensuring a stable supply of sheep sources, reducing costs through large-scale breeding, but may face challenges in obtaining premium sales at the terminal.

This study aims to elucidate the value-added-sharing structure within different product supply chains. In the following list, 'non-ARPB' products are similar products from unauthorized local enterprises or authorized enterprises that do not use regional brand trademarks. The term 'independent operation' refers to a scenario where the upstream and downstream operators in a supply chain maintain a competitive relationship without engaging in close cooperation to share benefits. This concept specifically addresses instances where unauthorized enterprises purchase raw materials and sell products in bulk or through supermarkets. These data are crucial when applying the Shapley value method to analyze benefit distribution in non-cooperative settings.

'Non-ARPB' in Table 4 indicates that herdsmen are selling live sheep at market prices without any price premium compared to the regional brand's traceable sheep. The net revenue of the herdsmen is 27.8 CNY/kg. Processing enterprises have not increased costs, yet the ex-factory price is lower than that for regional brand products, resulting in a net revenue of only 6 CNY/kg. After the products are sold through supermarkets, plus the revenue from wholesalers at all levels, the total net revenue is 9 CNY/kg. The combined net revenue of all operators in the supply chain is 42.8 CNY/kg, of which the revenue of farmers, processing companies, and sellers accounts for 65%, 14%, and 21% of the total revenue, respectively. By implementing 'forward integration' management strategies and opening direct-operated stores, sellers' net revenue could increase to 19 CNY/kg, raising the total net revenue of the supply chain to 52.8 CNY/kg. This shift would result in the proportions changing to 52.6%, 11.4%, and 36% for farmers, processing enterprises, and

sellers, respectively. The farmers' share of revenue would decrease, while the sellers' share would notably increase.

Table 4. Revenue-sharing structure of grass-fed sheep product supply chain (unit: CNY/kg,%).

Supply Chain Added Value	Non-ARPB				Xilingol's Sheep			
	Independent Operations		Forward Integration		Order Mode		Forward Integration	
	Supermarket Sales	Prop	Exclusive Sales	Prop	Supermarket Sales	Prop	Exclusive Sales	Prop
Breeding	27.8	65	27.8	52.6	28.8	67.6	28.8	49.2
Processing	6	14	6	11.4	4.82	11.3	6.8	11.6
Sales	9	21	19	36	9	21.1	23	39.2
Total	42.8	100	52.8	100	42.62	100	58.6	100

The establishment of the 'Xilingol's Sheep' regional brand has facilitated collaboration between authorized companies and those upstream and downstream. By raising the purchase price, herdsmen saw a direct increase in income of 1 CNY/kg. However, processing enterprises producing regional brand products incur an additional cost of 1.18 CNY/kg. If downstream sales continue through supermarkets without achieving a premium, the net revenue of processing enterprises will decrease. Consequently, the net revenue for farmers, processing enterprises, and sellers stands at 28.8 CNY/kg, 4.82 CNY/kg, and 9 CNY/kg, respectively, with revenue-sharing ratios of 67.6%, 11.3%, and 21.1%. By implementing a 'forward integration' management strategies, processing enterprises raise ex-factory prices through direct sales to terminals, while directly operated stores benefit from brand premiums. Consequently, the net revenue for each operator stands at CNY 28.8, 6.8, and 23, respectively, leading to a shift in the supply chain revenue distribution to 49.2%, 11.6%, and 39.2%. Although the revenue of herdsmen has increased, their revenue-sharing ratio has decreased. On the other hand, the revenue-sharing ratio of sellers has seen a rise, resulting in the combined sharing ratios for processing and sales reaching 50.8%.

In Table 5, it can be observed that the net revenue generated from breeding and processing grain-fed sheep is lower compared to grass-fed sheep under independent operation. The net revenue per kilogram stands at CNY 11 and 4.52. The sales revenue in supermarkets remains relatively stable, resulting in a revenue-sharing structure of 44.9%, 18.4%, and 36.7%. Enterprises under the 'Health Talks' authorization adopt a 'backward integration' management strategy to oversee the breed and breeding costs of mutton sheep, increasing the price of processed products upon leaving the factory. Even with bulk sales, the total revenue generated from breeding and processing can reach 29.4 CNY/kg, surpassing the 15.52 CNY/kg in the independent operation model. The combined sharing ratio also rises from 63.3% to 76.6%. If terminal sales are conducted through exclusive stores, the net sales revenue is expected to rise from 9 CNY/kg to 14.2 CNY/kg, leading to a continuous increase in the overall revenue of the supply chain. However, due to the separate operations of authorized enterprises and exclusive stores, the terminal price premiums are not seamlessly transferred to authorized enterprises. This has resulted in a shift in the revenue-sharing structure from 76.6% and 23.4% to 67.4% and 32.6%, with a significant increase in terminal sales profits.

In Table 6, 'Independent operation' refers to the scenario where farmers grow ordinary rice (non-green-planting) and sell it on the market without signing an order, and then processing companies purchase and process the products for sale in supermarkets. The net revenue per kilogram of rice for farmers, processing enterprises, and sellers is CNY 0.8, 1.36, and 0.53, respectively, with revenue distribution percentages of 29.7%, 50.6%, and 19.7%. If the processing enterprises establish a direct store for sales, the seller's net revenue would increase to 1.3 CNY/kg, and the revenue distribution structure would then adjust to 23.1%, 39.3%, and 37.6%. The overall revenue of the supply chain increased to 3.46 CNY/kg; however, farmers' revenue remained stagnant, and their income-sharing

ratio decreased. The total proportion of processing and sales rose from the original 70.3% to 76.9%, but the price premium failed to transmit to farmers.

Table 5. Revenue-sharing structure of grain-fed sheep product supply chain (unit: CNY/kg,%).

Supply Chain Added Value	Non-ARPB Independent Operations		Health Talks Backward Integration			
	Supermarket Sales	Prop	Supermarket Sales	Prop	Exclusive Sales	Prop
Breeding	11	44.9	0	0	0	0
Processing	4.52	18.4	29.4	76.6	29.4	67.4
Sales	9	36.7	9	23.4	14.2	32.6
Total	24.52	100	38.4	100	43.6	100

Table 6. Revenue-sharing structure of rice supply chain (unit: CNY/kg,%).

Supply Chain Added Value	Non-ARPB				Hinggan League Rice			
	Independent Operations		Forward Integration		Order Mode		Forward Integration	
	Supermarket	Prop	Exclusive Sales	Prop	Supermarket	Prop	Exclusive Sales	Prop
Planting	0.8	29.7	0.8	23.1	1.06	14.8	1.06	13.4
Processing	1.36	50.6	1.36	39.3	2.5	35	2.5	31.6
Sales	0.53	19.7	1.3	37.6	3.59	50.2	4.36	55
Total	2.69	100	3.46	100	7.15	100	7.92	100

After the establishment of the 'Hinggan league rice' regional brand, all green-grown japonica rice in the area can utilize the regional brand trademark. Authorized enterprises collaborate with both upstream and downstream partners, entering into purchase agreements with farmers. When the products are distributed in supermarkets, the net revenue per kilogram of rice for farmers, processing enterprises, and sellers amounts to CNY 1.06, 2.5, and 3.59, respectively, with a revenue-sharing ratio of 14.8%, 35%, and 50.2%. By adopting a 'forward integration' management strategy and engaging in direct sales, the net revenue per kilogram of rice for farmers, processing enterprises, and sellers will be CNY 1.06, 2.5, and 4.36, respectively, leading to a total revenue of 7.92 CNY/kg for the supply chain. This results in a revised revenue-sharing structure of 1.34%, 31.6%, and 55%. In comparison to supermarket sales, the total percentage of processing and sales has increased from 85.2% to 86.6%.

3.4. Supply Chain Revenue-Sharing Structure Optimization

The Shapley value method can be utilized to assess the significance of each link in the advancement of regional public brands and determine the optimal revenue-sharing plan. By substituting the field survey data into the relevant formulas, the revenue and cost of each operator can be calculated when operating independently, in pairwise cooperation, and in tripartite cooperation. Regional brand cooperation is calculated based on exclusive store sales, while independent operations are assessed based on supermarket sales. The revenue generated from tripartite cooperation is the total revenue from all operators in the regional brand supply chain.

If each operator in the supply chain works independently, the cost is C_i, the revenue is R_i, and the net revenue is v(i), i = 1, 2, 3, representing farmers (cooperatives), processing enterprises, and sellers, respectively. After establishing a regional brand, each operator seeks collaboration, and the corresponding indicators are set to BC_i, BR_i, and X_i. Farmers (cooperatives), processing enterprises, and sellers transition from individual operations to collaborating under an ARPB; there will be various forms of cooperation. The benefit from cooperation between farmers and processing enterprises is represented by $v(S_1)$, while $v(S_2)$ represents the benefit from cooperation between farmers and sellers. Additionally, $v(S_3)$ denotes the benefit from cooperation between processing enterprises and sellers. The overall

benefit from all operators participating in the cooperation is denoted as v(I). When farmers collaborate with processing enterprises but remain non-cooperative with sellers (supermarket sales), the revenue function is calculated as $v(S_1) = BR_2 - (BC_2\text{-}BR_1) - BC_1 = X_1 + X_2$. The absence of product conversion hinders true cooperation between farmers and sellers, resulting in the total revenue obtained being the sum of their individual revenues, represented by $v(S_2) = v(1) + v(3)$. When processing enterprises engage in cooperation with sellers but not with farmers, the revenue is calculated as $v(S_3) = BR_3 - (BC_3 - BR_2) - BC_2 = X_2 + X_3$; however, when all operators participate in cooperation, the revenue is calculated as $v(I) = BR_3 - (BC_3 - BR_2) - (BC_2 - BR_1) - BC_1 = X_1 + X_2 + X_3$.

Table 7 displays the revenues generated by various cooperative arrangements among operators in the grass-fed sheep supply chain; the results were calculated using the data in Tables 2 and 4, which served as the basis for conducting the Shapley value calculation. The analysis reveals that the collaborative revenue between any two operators surpasses the individual operation revenue, with the highest revenue achieved through overall supply chain collaboration. By fostering regional brands and promoting cooperation among operators, additional value is created, leading to a total revenue increase from 52.8 CNY/kg in independent operation to 58.62 CNY/kg. Based on Table 7, complete the calculation of the Shapley values in Tables 8–10.

Table 7. Net revenue matrix of grass-fed sheep when different operators cooperate (unit: CNY/kg).

Supply Chain Link	Breeding	Processing	Sales
Breeding	27.8	35.62	51.8
Processing	35.62	6	29.82
Sales	51.8	29.82	9

Table 8. Revenue distribution of herdsmen under 'Xilingol's Sheep' (unit: CNY/kg).

Step	Breeding	Breeding + Processing	Breeding + Sales	B + P + S
$v(s)$	27.8	35.62	51.8	58.62
$v(s\backslash i)$	0	6	9	29.82
$v(s) - v(s\backslash i)$	27.8	29.62	42.8	28.8
$\lvert s \rvert$	1	2	2	3
$w(\lvert s \rvert)$	1/3	1/6	1/6	1/3
$w(\lvert s \rvert)[v(s) - v(s\backslash i)]$	9.27	4.94	7.13	9.6

Table 9. Revenue distribution of processing enterprises under 'Xilingol's Sheep' (unit: CNY/kg).

Step	Processing	Breeding + Processing	Processing + Sales	B + P + S
$v(s)$	6	35.62	29.82	58.62
$v(s\backslash i)$	0	27.8	9	51.8
$v(s) - v(s\backslash i)$	6	7.82	20.82	6.82
$\lvert s \rvert$	1	2	2	3
$w(\lvert s \rvert)$	1/3	1/6	1/6	1/3
$w(\lvert s \rvert)[v(s) - v(s\backslash i)]$	2	1.3	3.47	2.27

Table 10. Revenue distribution of sellers under 'Xilingol's Sheep' (unit: CNY/kg).

Step	Sales	Breeding + Sales	Processing + Sales	B + P + S
$v(s)$	9	51.8	29.82	58.62
$v(s\backslash i)$	0	27.8	6	35.62
$v(s) - v(s\backslash i)$	9	24	23.82	23
$\mid s \mid$	1	2	2	3
$w(\mid s \mid)$	1/3	1/6	1/6	1/3
$w(\mid s \mid)[v(s) - v(s\backslash i)]$	3	4	3.97	7.67

Summing up the last row of each table gives the following:

The revenue of the breeding: $\varphi_1(\nu\nu) = 9.27 + 4.94 + 7.13 + 9.6 = 30.94$ CNY/kg;

The revenue of the processing: $\varphi_2(\nu) = 2 + 1.3 + 3.47 + 2.27 = 9.04$ CNY/kg;

The revenue of the sales: $\varphi_3(\nu) = 3 + 4 + 3.97 + 7.67 = 18.64$ CNY/kg.

As shown in Figure 1, the analysis reveals that when each operator functions independently, the revenue-sharing structure within the supply chain stands at 65%, 14%, and 21%. Upon transitioning to collaborative operations for the 'Xilingol's Sheep' brand, the revenue-sharing structure shifts to 49.2%, 11.6%, and 39.2%. Following optimization using the Shapley value method, net revenue for the breeding, processing, and sales amounts to 30.94 CNY/kg, 9.04 CNY/kg, and 18.64 CNY/kg, respectively, and the sharing ratio is further refined to 52.8%, 15.4%, and 31.8%.

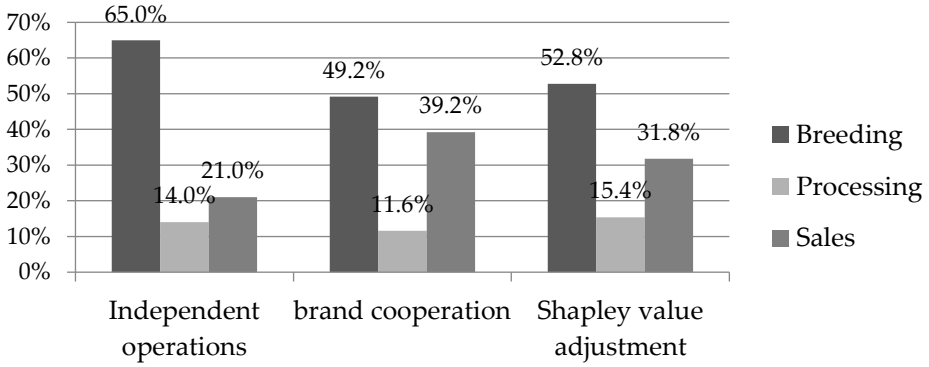

Figure 1. Comparison of the revenue-sharing structure of the 'Xilingol's Sheep' supply chain.

According to the above method, the optimization of the revenue distribution structure for the two brands 'Health Talks' and 'Hinggan league rice' has been finalized. The specific steps have been omitted for brevity. Table 11 displays the revenues generated by various cooperative arrangements among operators in the grain-fed sheep supply chain; the results were calculated using the data in Tables 2 and 5.

Table 11. Net revenue matrix of grain-fed sheep when different operators cooperate (unit: CNY/kg).

Supply Chain Link	Breeding	Processing	Sales
Breeding	11	29.35	14.2
Processing	29.35	4.52	43.55
Sales	14.2	43.55	9

Based on Table 11, the calculation of the following Shapley value is completed:

The revenue of the breeding: $\varphi_1(\nu) = 3.67 + 4.14 + 0.87 + 0 = 8.68$ CNY/kg;

The revenue of the processing: $\varphi_2(\nu) = 1.51 + 3.06 + 5.76 + 9.78 = 20.11$ CNY/kg;

The revenue of the sales: $\varphi_3(\nu) = 3 + 0.53 + 6.51 + 4.73 = 14.77$ CNY/kg.

As shown in Figure 2, the analysis reveals that when each operator functions independently, the revenue-sharing structure within the supply chain stands at 44.9%, 18.4%,

and 36.7%. Upon transitioning to collaborative operations for the 'Health Talks' brand, the revenue-sharing structure shifts to 0%, 67.4%, and 32.6%. The proportion of total revenue from breeding and processing increased from 63.3% to 67.4%, and the sharing ratio has expanded. Following optimization using the Shapley value method, the net revenue for breeding, processing, and sales amounts to 8.68 CNY/kg, 20.11 CNY/kg, and 14.77 CNY/kg, respectively. Additionally, the sharing ratio is further refined to 19.9%, 46.2%, and 33.9%. The proportion of total revenue from breeding and processing is 66.1%; in comparison to the regional brand supply chain, this proportion has slightly decreased, while the sharing ratio of the sales has risen from 32.6% to 33.9%.

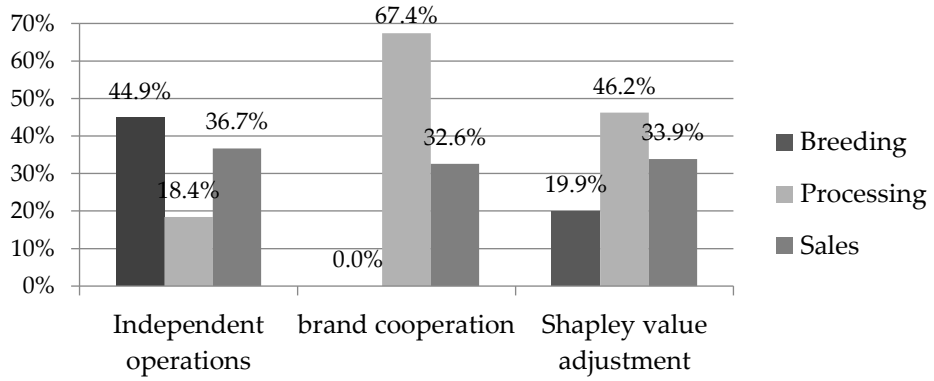

Figure 2. Comparison of the revenue-sharing structure of the 'Health Talks' supply chain.

Table 12 displays the revenues generated by various cooperative arrangements among operators in the rice supply chain; the results were calculated using the data in Tables 3 and 6.

Table 12. Net revenue matrix of rice when different operators cooperate (unit: CNY/kg).

Supply Chain Link	Planting	Processing	Sales
Planting	0.8	3.56	5.42
Processing	3.56	1.36	6.86
Sales	5.42	6.86	0.53

Based on Table 12, the calculation of the following Shapley value is completed:
The revenue of the planting: $\varphi_1(v) = 0.27 + 0.37 + 0.69 + 0.35 = 1.68$ CNY/kg;
The revenue of the processing: $\varphi_2(v) = 0.45 + 0.46 + 0.69 + 0.83 = 2.43$ CNY/kg;
The revenue of the sales: $\varphi_3(v) = 0.43 + 0.77 + 0.92 + 1.45 = 3.57$ CNY/kg.

As shown in Figure 3, the analysis reveals that when each operator functions independently, the revenue-sharing structure within the supply chain stands at 29.7%, 50.6%, and 19.7%. Upon transitioning to collaborative operations for the 'Hinggan league rice' brand, the revenue-sharing structure shifts to 13.4%, 31.6%, and 55%. Following optimization using the Shapley value method, net revenue for the planting, processing, and sales amounts to 1.68 CNY/kg, 2.43 CNY/kg, and 3.57 CNY/kg, respectively. Additionally, the sharing ratio is further refined to 21.9%, 31.6%, and 46.5%. Compared to the regional brand supply chain, there has been little change in the sharing ratio of the processing, an increase in the sharing ratio of planting, and a decrease in the proportion of sales.

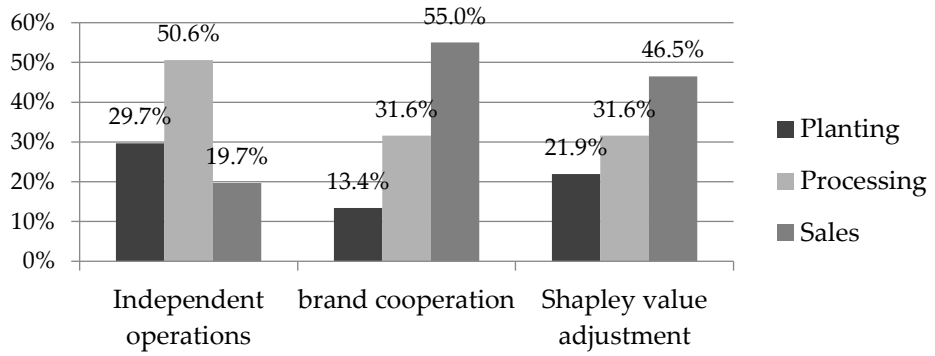

Figure 3. Comparison of the revenue-sharing structure of the 'Hinggan league rice' supply chain.

4. Discussion

ARPBs are established based on GIs with the primary goal of concentrating superior agricultural resources in a specific region, fostering high-quality sustainable agriculture, boosting agricultural income, and improving the livelihoods of farmers. This paper presents an empirical examination of this concept, investigating how the development of ARPBs can enhance farmers' capacity to consistently raise their revenue. The study delves into several case studies to assess whether the prices of agricultural products bearing regional brands will increase, if farmers' revenue will see a rise, and whether there will be an increase in farmers' revenue-sharing ratio within the supply chain.

There is limited international research on how ARPBs can help farmers increase their revenue sustainably. However, existing studies on geographical indications offer valuable insights. Lee YJ et al. suggest that geographical labels signify differences in the quality and safety of agricultural products, leading to increased consumer willingness to pay [27,28,48]. Cei L. et al. argue that GI can positively influence farmers' safety behaviors and add value to agriculture products [9,12]. These studies reveal that even in the growth stage, an ARPB can command a premium. Nonetheless, ARPB products are typically small in scale and do not benefit all farmers in the region, resulting in limited overall income growth [29]. When Sepúlveda W.S. et al. examined the attitudes of Spanish farmers towards the production of GI lambs, they discovered that commercial interests play a significant role in motivating farmers to produce GI lambs. However, not all farmers are convinced that GI can lead to increased commercial benefits [49]. Torok A. also argues that while certain GI may command a price premium, this may not necessarily translate to higher income for producers, as they may face elevated production costs and uneven distribution within the value chain [31].

Different product characteristics have varying market demand elasticities, and regional brands exhibit differing premium capabilities. Yin X argues that while GI can greatly enhance agricultural value added and increase rural per capita disposable income, the impact varies depending on the specific category of GIs [17]. Chen M and Zhong S suggest that consumers with diverse characteristics exhibit varying preferences for certification labels due to differing levels of food safety knowledge and environmental beliefs [50,51]. These perspectives were also partially validated in this study. The analysis of three cases revealed that farmers and herdsmen derive greater benefits from grass-fed sheep compared to regional brands of grain-fed sheep. Furthermore, green rice and organic rice are more likely to command a premium compared to regular rice. Xue H conducted a study on consumer preferences for beef and highlighted that palatability attributes are key in shaping consumer preferences and willingness to pay. Consumers tend to prefer grass-fed beef over traditional beef [52].

Regional brand products have shown different levels of growth in price and net revenue compared to similar unauthorized products. The method of selling the product significantly impacts the price premium, with bulk sales (supermarket sales) diminishing the brand effect and direct terminal retail sales facilitating brand premiums. Peng L

suggested that farmers could boost their income through live-streaming sales, particularly in the aftermath of the COVID-19 pandemic [14]. While this article did not delve into online sales, the notion that interacting directly with end consumers can result in higher revenue aligns with the findings of other scholars. In contrast, Boatto V proposed that consumers are more willing to pay for purchases at large retailers compared to specialty stores. This is because the information provided by specialty store retailers is not as persuasive as the quality signals displayed on the label [4]. Regional brands have the potential to combine merchants' personal recommendations with label displays.

Neilson J's study on Indonesian GIs highlighted the lack of concrete evidence regarding the economic benefits for coffee growers, as GIs have not yet facilitated strategic partnerships between farmers with industry leaders [53]. Similarly, Minten B observed that the rise of local brands in the market has not directly translated into benefits for farmers [26]. Weber GJ also argues that solely depending on price premiums may not significantly improve farmers' returns [6]. Only when the premium of regional brand sales terminals can be effectively passed upward can the farmers' revenue be increased. This study found that the establishment of an ARPB has somewhat contributed to the rise in revenue for farmers, either directly or indirectly. Nevertheless, analyzing the value-added-sharing structure reveals a decrease in the revenue-sharing ratio within the stages of planting and breeding, while there has been a notable increase in the revenue-sharing ratio within the sales stage.

Mjonono M and Wang J argue that farmers' participation in benefiting from the agricultural value chain is contingent upon their ability to access value and their mode of participation [30,54]. Without forming closer cooperative relationships with processing enterprises, farmers may not be able to fully benefit from the added value of regional brands. Ray N. posits that the order model may not effectively enhance farmers' profitability [55]. Despite predetermined selling prices through contracts, there remains a competitive dynamic between upstream and downstream operators, limiting farmers' ability to fully benefit from regional brand terminals. Miyata S emphasizes the importance of contract farming in increasing the income of small-scale farmers [56].

Each link in the supply chain has varying effects on the characteristics of crop and livestock products, as well as differing impacts on the creation of ARPB value. When modifying the value-added-sharing structure of regional brands, careful consideration should be given to these factors. Bonisoli L and Zheng S emphasized the significance of traceability information related to farming methods and growth environments for agricultural products [57,58]. Bonisoli L highlighted the influence of environmental concern on brand loyalty, with agricultural brands playing a crucial role as an origin identifier [57]. Therefore, adjusting the revenue-sharing ratio through the Shapley value method actually leads to an increase in the value-added-sharing ratio of planting and breeding.

5. Conclusions and Recommendations

5.1. Conclusions

By analyzing changes in prices and supply chain revenue-sharing structure between ARPB and non-ARPB products, this research suggests that regional brands with varying product characteristics exhibit different capabilities in terms of premium pricing [7]. While these premiums are achieved to some extent, the overall increase in income for farmers in the region is limited [59]. ARPB products are distributed through various sales channels, each with varying price premium capabilities. Direct sales at terminals can boost the overall revenue of the supply chain and operators. Establishing an ARPB enhances the value-added-sharing ratio in sales, while decreasing it in farming. To increase the share of regional brands' added value in farming, integration or closer collaboration with downstream supply chain partners is necessary [60]. The adjustment of the value-added-sharing structure should take into account the contribution to regional brand value formation and tend to increase the revenue-sharing ratio in planting and breeding.

This study is a test of the effectiveness of ARPB building. Through real-life cases, the impact of regional brands on agricultural products' prices, farmers' revenue, and farmers'

ability to share supply chain revenue is verified. The findings offer valuable insights for government and regional brand management departments to develop appropriate policies and measures and provide useful guidance for supply chain operators to enhance collaboration. The suggestions can support the development of ARPBs, enhancing farmers' capacity to boost their revenue. Relevant research supplements the lack of research on the value realization of ARPBs from the perspective of producers.

This paper examines representative mutton and rice regional brands in Inner Mongolia to draw conclusions. It is important to note that the findings may not be universally applicable to all regional brands. Many ARPBs are relatively new and may not have fully established their brand impact. As a result, the inability to utilize 'Differences-in-Differences' and other methods to analyze pre- and post-brand-establishment changes is a limitation. Furthermore, ARPBs are often used in conjunction with authorized enterprise brands, making it challenging to completely isolate the influence of enterprise brands even with horizontal comparisons. The COVID-19 epidemic has dampened consumption power, hindering the growth of ARPB premiums and market expansion. The data from 2022 may not accurately reflect future trends.

Further research should focus on analyzing how ARPB premiums can be effectively communicated upstream in the supply chain, identifying influencing factors, and distinguishing this process from other value transmission studies in the supply chain. Additionally, research should explore how farmers with fragmented power can leverage ARPBs to enhance organizational cohesion and reshape collaborative relationships within ARPB supply chains.

5.2. Recommendations

Only by increasing the revenue of farmers and enhancing their share of revenue in the supply chain can we effectively shift the market position of farmers. To enhance the capacity of farmers to boost their revenue through ARPBs, we should focus on the following aspects:

5.2.1. Ensure the Source of Products by Strengthening Origin Certification and Market Supervision

ARPBs possess regional, public, and multi-operator characteristics, making the issue of 'free riding' inevitable. By reinforcing origin certification and market supervision, not only can the reputation of regional brands be upheld, but the market standing of farming can also be bolstered. This will guarantee the authenticity of products, thereby safeguarding the welfare of farmers.

5.2.2. Expand Brand Awareness and Improve Terminal Sales Control

The popularity and influence of an ARPB have a direct impact on the demand elasticity and price premium potential of products. It is important for all operators in the supply chain to work together under the concept of a community of interests, serving consumers with unified standards. This will help improve consumer brand loyalty and terminal sales control capabilities and enhance the price premium potential of an ARPB [61].

5.2.3. Improve the Organizational Intensity and Market Player Status of Farmers

The construction of an ARPB necessitates the consolidation of factor resources, enhancing collaboration among various operators in the supply chain, establishing a community of shared interests, and maintaining consistent objectives. This is crucial for harnessing the positive synergy of regional brands and maximizing profit. Traditional contractual arrangements often lack stability and are susceptible to fluctuations in the market environment and prices, leading to contract breaches [56]. To address this, enhancing the organizational structure of small-scale farmers through cooperatives, collective economic entities, and other organizational forms is recommended. This will enhance the product transformation and sales capabilities of crop and livestock producers and reinforce their roles and specialization within the supply chain [62,63]. By fostering cooperation between farmers

and commercial entities based on property rights alignment and integrated management, long-term collaborative relationships can be established, enhancing the ability of farmers to share benefits along the supply chain.

5.2.4. Government Appropriately Intervenes in ARPB Revenue-Sharing in the Early Stages

It is commonly believed that government guidance and promotion play a crucial role in the initial stages of an ARPB. During this phase, the government should implement policies to intervene in the operation and management of regional brands, including revenue-sharing, price adjustments for primary products, and safeguarding the interests of crop and livestock producers. Increasing the share of brand value added by farmers helps to maintain their motivation to adhere to standards and ensure product safety [64,65]. When regional brands have a significant market presence and create spontaneous market behavior, there is a greater reliance on market forces to regulate the relationships of interest among operators.

Supplementary Materials: Supplementary data to this article can be found online at http://www.moa.gov.cn/nybgb/2015/liu/201712/t20171219_6103855.htm (accessed on 15 March 2024); http://www.stats.gov.cn/sj/zxfb/202402/t20240228_1947915.html (accessed on 15 March 2024); https://www.nmg.gov.cn/zwyw/gzdt/bmdt/202310/t20231014_2393306.html?dzb=true (accessed on 20 December 2023); http://czj.xlgl.gov.cn/eportal/ui?pageId=3b43f52fc2b6419a903a041fffe04af9 (accessed on 20 December 2023); http://tj.nmg.gov.cn/; https://www.bynr.gov.cn/; http://www.xam.gov.cn/ (accessed on 20 December 2023).

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References

1. Christensen, B.C.; Kenney, M.; Patton, D. Regional identity can add value to agricultural products. *Calif. Agric.* **2015**, *69*, 85–91. [CrossRef]
2. Minten, B.; Singh, K.M.; Sutradhar, R. Branding and agricultural value chains in developing countries: Insights from Bihar (India). *Food Policy* **2013**, *38*, 23–34. [CrossRef]
3. Zheng, S.; Xu, P.; Wang, Z. Are nutrition labels useful for the purchase of a familiar food? Evidence from Chinese consumers' purchase of rice. *Front. Bus. Res. China* **2011**, *5*, 402–421. [CrossRef]
4. Boatto, V.; Defrancesco, E.; Trestini, S. The price premium for wine quality signals: Does retailers' information provision matter? *Br. Food J.* **2011**, *113*, 669–679. [CrossRef]
5. Kleih, A.-K.; Lehberger, M.; Sparke, K. Preference for branded fresh produce and consumers' need for uniqueness: A mixed-methods investigation of consumer choice and thought process. *Appetite* **2023**, *180*, 106321. [CrossRef] [PubMed]
6. Weber, J.G. How much more do growers receive for Fair Trade-organic coffee? *Food Policy* **2011**, *36*, 677–684. [CrossRef]
7. Stampa, E.; Schipmann-Schwarze, C.; Hamm, U. Consumer perceptions, preferences, and behavior regarding pasture-raised livestock products: A review. *Food Qual. Prefer.* **2020**, *82*, 103872. [CrossRef]
8. Steenkamp, J.-B.E.; Van Heerde, H.J.; Geyskens, I. What Makes Consumers Willing to Pay a Price Premium for National Brands over Private Labels? *J. Mark. Res.* **2010**, *47*, 1011–1024. [CrossRef]

9. Menggala, S.R.; Vanhove, W.; Muhammad, D.R.A.; Rahman, A.; Speelman, S.; Van Damme, P. The Effect of Geographical Indications (GIs) on the Koerintji Cinnamon Sales Price and Information of Origin. *Agronomy* **2021**, *11*, 1410. [CrossRef]
10. Hoang, G.; Le, H.T.T.; Nguyen, A.H.; Dao, Q.M.T. The Impact of Geographical Indications on Sustainable Rural Development: A Case Study of the Vietnamese Cao Phong Orange. *Sustainability* **2020**, *12*, 4711. [CrossRef]
11. Li, C.; Gao, J.; Ge, L.; Hu, W.; Ban, Q. Do Geographical Indication Products Promote the Growth of the Agricultural Economy? An Empirical Study Based on Meta-Analysis. *Sustainability* **2023**, *15*, 14428. [CrossRef]
12. Cei, L.; Stefani, G.; Defrancesco, E.; Lombardi, G.V. Geographical indications: A first assessment of the impact on rural development in Italian NUTS3 regions. *Land Use Policy* **2018**, *75*, 620–630. [CrossRef]
13. Pike, A. Economic Geographies of Brands and Branding. *Econ. Geogr.* **2013**, *89*, 317–339. [CrossRef]
14. Peng, L.; Lu, G.; Pang, K.; Yao, Q. Optimal farmer's income from farm products sales on live streaming with random rewards: Case from China's rural revitalisation strategy. *Comput. Electron. Agric.* **2021**, *189*, 106403. [CrossRef]
15. Chiambaretto, P.; Gurău, C.; Le Roy, F. Coopetitive branding: Definition, typology, benefits and risks. *Ind. Mark. Manag.* **2016**, *57*, 86–96. [CrossRef]
16. Zheng, X.; Huang, Q.; Zheng, S. The Identification and Applicability of Regional Brand-Driving Modes for Agricultural Products. *Agriculture* **2022**, *12*, 1127. [CrossRef]
17. Yin, X.; Li, J.; Wu, J.; Cao, R.; Xin, S.; Liu, J. Impacts of Geographical Indications on Agricultural Growth and Farmers' Income in Rural China. *Agriculture* **2024**, *14*, 113. [CrossRef]
18. Castillo-Díaz, F.J.; Belmonte-Ureña, L.J.; López-Serrano, M.J.; Camacho-Ferre, F. Assessment of the sustainability of the European agri-food sector in the context of the circular economy. *Sustain. Prod. Consum.* **2023**, *40*, 398–411. [CrossRef]
19. Zhou, H.; Zhang, Y.; Zhou, L. The impact of government policies on place branding performance: Evidence from China. *Total. Qual. Manag. Bus. Excel.* **2022**, *34*, 712–742. [CrossRef]
20. Goffic, L.C.; Zappalaglio, A. The Role Played by the US Government in Protecting Geographical Indications. *World Dev.* **2017**, *98*, 35–44. [CrossRef]
21. Durand, C.; Fournier, S. Can Geographical Indications Modernize Indonesian and Vietnamese Agriculture? Analyzing the Role of National and Local Governments and Producers' Strategies. *World Dev.* **2017**, *98*, 93–104. [CrossRef]
22. Hinkes, C.; Schulze-Ehlers, B. Consumer attitudes and preferences towards pangasius and tilapia: The role of sustainability certification and the country of origin. *Appetite* **2018**, *127*, 171–181. [CrossRef] [PubMed]
23. Suh, J.; MacPherson, A. The impact of geographical indication on the revitalisation of a regional economy: A case study of 'Boseong' green tea. *Area* **2007**, *39*, 518–527. [CrossRef]
24. Messely, L.; Dessein, J.; Rogge, E. Behind the Scenes of Place Branding: Unraveling the Selective Nature of Regional Branding. *Tijdschr. Econ. Soc. Geogr.* **2014**, *106*, 291–306. [CrossRef]
25. Dania, W.A.P.; Xing, K.; Amer, Y. Collaboration behavioural factors for sustainable agri-food supply chains: A systematic review. *J. Clean. Prod.* **2018**, *186*, 851–864. [CrossRef]
26. Lin, H.; Xiong, X.; Liu, Y.; Zhao, Y.; Tang, R.; Nyandwi, C. The substitution effect of grass-fed livestock products on grain-fed livestock products from the perspective of supply-side reform in China. *Rangel. J.* **2021**, *43*, 377–387. [CrossRef]
27. Rao, F.; Chenguang, L.; Wang, L.; Gao, Z. Chinese consumer preference for beef with Geographical indications and other attributes. *Meat Sci.* **2024**, *212*, 109475. [CrossRef] [PubMed]
28. Lee, J.Y.; Pavasopon, N.; Napasintuwong, O.; Nayga, R.M. Consumers' Valuation of Geographical Indication-Labeled Food: The Case of Hom Mali Rice in Bangkok. *Asian Econ. J.* **2020**, *34*, 79–96. [CrossRef]
29. Kilelu, C.W.; Klerkx, L.; Leeuwis, C. Supporting smallholder commercialisation by enhancing integrated coordination in agrifood value chains. *Exp. Agric.* **2016**, *53*, 269–287. [CrossRef]
30. Mjonono, M.; Marwa, N.; Coetzee, G. Value for smallholder farmers participating in the agricultural value chain: Towards the development of a conceptual framework. *J. Agribus. Rural. Dev.* **2020**, *55*, 37–44. [CrossRef]
31. Torok, A.; Jantyik, L.; Maró, Z.M.; Moir, H.V.J. Understanding the Real-World Impact of Geographical Indications: A Critical Review of the Empirical Economic Literature. *Sustainability* **2020**, *12*, 9434. [CrossRef]
32. Wang, G.; Wang, M.; Wang, J.; Yang, C.; Liu, Y. Characteristics and influencing factors of grass-feeding livestock breeding in China: An economic geographical perspective. *J. Geogr. Sci.* **2016**, *26*, 501–512. [CrossRef]
33. Kafle, K.; Songsermsawas, T.; Winters, P. Agricultural value chain development in Nepal: Understanding mechanisms for poverty reduction. *Agric. Econ.* **2022**, *53*, 356–373. [CrossRef]
34. Hyde, J.; Foster, K. Estimating Dynamic Relationships between Pork Advertising and Revenues. *Appl. Econ. Perspect. Policy* **2003**, *25*, 279–293. [CrossRef]
35. Jin, Y.H.; Zilberman, D.; Heiman, A.; Li, Y. Willingness to pay for brands: A cross-region, cross-category analysis. *Agric. Econ.* **2010**, *42*, 141–152. [CrossRef]
36. Wang, Y.; Zhao, Z.; Baležentis, T. Benefit distribution in shared private charging pile projects based on modified Shapley value. *Energy* **2023**, *263*, 125720. [CrossRef]
37. He, W.; Liu, M.; Zuo, C.; Wang, K. Massive Multi-Source Joint Outbound and Benefit Distribution Model Based on Cooperative Game. *Energies* **2023**, *16*, 6590. [CrossRef]
38. Zhu, J.; Wang, J.; Fang, W.; Yu, S. Schemes for Allocation of Benefits from Contracted Water-Saving:The Case of Irrigated Field Projects in China. *Water Econ. Policy* **2023**, *9*, 1. [CrossRef]

39. Swagemakers, P.; Schermer, M.; García, M.D.D.; Milone, P.; Ventura, F. To what extent do brands contribute to sustainability transition in agricultural production practices? Lessons from three European case studies. *Ecol. Econ.* **2021**, *189*, 107179. [CrossRef]
40. Ruml, A.; Ragasa, C.; Qaim, M. Contract farming, contract design and smallholder livelihoods. *Aust. J. Agric. Resour. Econ.* **2021**, *66*, 24–43. [CrossRef]
41. Hu, W.-Y. Effect of contract farming on the U.S. crop farmers' average return. *Agric. Econ.* **2013**, *64*, 195–201. [CrossRef]
42. Traversac, J.-B.; Rousset, S.; Perrier-Cornet, P. Farm resources, transaction costs and forward integration in agriculture: Evidence from French wine producers. *Food Policy* **2011**, *36*, 839–847. [CrossRef]
43. Zhang, L.; Peng, X. Analysis of Optimal Strategies in a Two-Echelon Digital Products Supply Chain Considering Consumer Types. *Natl. Acad. Sci. Lett.* **2020**, *43*, 449–451. [CrossRef]
44. Feng, S.; Patton, M.; Burgess, D.E. Willingness of beef finishers to participate in supply chain collaborations. *Br. Food J.* **2019**, *121*, 505–519. [CrossRef]
45. Grau, A.J.; Reig, A. Vertical integration and profitability of the agrifood industry in an economic crisis context. *Span. J. Agric. Res.* **2015**, *13*, e0107. [CrossRef]
46. Deb, L.; Lee, Y.; Lee, S.H. Market Integration and Price Transmission in the Vertical Supply Chain of Rice: An Evidence from Bangladesh. *Agriculture* **2020**, *10*, 271. [CrossRef]
47. Lin, Y.; Parlaktürk, A.K.; Swaminathan, J.M. Vertical Integration under Competition: Forward, Backward, or No Integration? *Prod. Oper. Manag.* **2014**, *23*, 19–35. [CrossRef]
48. Liu, S.; Gao, Z.; Zhu, X. Development Trend of Agricultural Brand E-commerce Mode from the Perspective of New Media. *J. Phys. Conf. Ser.* **2021**, *1992*, 042052. [CrossRef]
49. Sepúlveda, W.S.; Maza, M.T.; Pardos, L.; Fantova, E.; Mantecón, Á.R. Farmers' attitudes towards lamb meat production under a Protected Geographical Indication. *Small Rumin. Res.* **2010**, *94*, 90–97. [CrossRef]
50. Chen, M.; Yin, S.; Xu, Y.; Wang, Z. Consumers' willingness to pay for tomatoes carrying different organic labels. *Br. Food J.* **2015**, *117*, 2814–2830. [CrossRef]
51. Zhong, S.; Chen, J. How Environmental Beliefs Affect Consumer Willingness to Pay for the Greenness Premium of Low-Carbon Agricultural Products in China: Theoretical Model and Survey-based Evidence. *Sustainability* **2019**, *11*, 592. [CrossRef]
52. Xue, H.; Mainville, D.; You, W.; Nayga, R.M. Consumer preferences and willingness to pay for grass-fed beef: Empirical evidence from in-store experiments. *Food Qual. Prefer.* **2010**, *21*, 857–866. [CrossRef]
53. Neilson, J.; Wright, J.; Aklimawati, L. Geographical indications and value capture in the Indonesia coffee sector. *J. Rural. Stud.* **2018**, *59*, 35–48. [CrossRef]
54. Wang, J.; Xue, Y.; Wang, P.; Chen, J.; Yao, L. Participation mode and production efficiency enhancement mechanism of Geographical Indication products in rural areas: A meta-frontier analysis. *Phys. Chem. Earth Parts A/B/C* **2021**, *121*, 102982. [CrossRef]
55. Ray, N.; Clarke, G.; Waley, P. The impact of contract farming on the welfare and livelihoods of farmers: A village case study from West Bengal. *J. Rural. Stud.* **2021**, *86*, 127–135. [CrossRef]
56. Miyata, S.; Minot, N.; Hu, D. Impact of Contract Farming on Income: Linking Small Farmers, Packers, and Supermarkets in China. *World Dev.* **2009**, *37*, 1781–1790. [CrossRef]
57. Bonisoli, L.; Guanuna, R.A.B. Going green in Ecuador: Unpacking the motivations behind brand loyalty for organic products. *J. Clean. Prod.* **2023**, *418*, 138116. [CrossRef]
58. Zheng, S.; Xu, P.; Wang, Z.; Song, S. Willingness to pay for traceable pork: Evidence from Beijing, China. *China Agric. Econ. Rev.* **2012**, *4*, 200–215. [CrossRef]
59. Duan, W.; Jiang, M.; Qi, J. Agricultural certification, market access and rural economic growth: Evidence from poverty-stricken counties in China. *Econ. Anal. Policy* **2024**, *81*, 99–114. [CrossRef]
60. Shi, Z.; Cao, E. Risk pooling cooperative games in contract farming. *Can. J. Agric. Econ.* **2021**, *69*, 117–139. [CrossRef]
61. Gold, M.; Godsey, L.; Josiah, S. Markets and marketing strategies for agroforestry specialty products in North America. *Agrofor. Syst.* **2004**, *61–62*, 371–384. [CrossRef]
62. Grashuis, N.J. Branding by U.S. Farmer Cooperatives: An empirical study of trademark ownership. *J. Co-Op. Organ. Manag.* **2017**, *5*, 57–64. [CrossRef]
63. Ma, W.; Abdulai, A. Does cooperative membership improve household welfare? Evidence from apple farmers in China. *Food Policy* **2016**, *58*, 94–102. [CrossRef]
64. Li, G.; Sun, X. The Impact of Green Brand Crises on Green Brand Trust: An Empirical Study. *Sustainability* **2022**, *14*, 611. [CrossRef]
65. Mai, N.; Bogason, S.G.; Arason, S.; Árnason, S.V.; Matthíasson, T.G. Benefits of traceability in fish supply chains–case studies. *Br. Food J.* **2010**, *112*, 976–1002. [CrossRef]