coatings

MDPI

Article

Assessing Consumers' Preference and Loyalty towards Biopolymer Films for Food Active Packaging

Maria-Ioana Socaciu [1,2], Veronica Câmpian [3], Dan-Cristian Dabija [4,*], Melinda Fogarasi [1,2], Cristina Anamaria Semeniuc [1,2,*], Andersina Simina Podar [2,5] and Dan Cristian Vodnar [2,5]

1 Department of Food Engineering, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăștur, 400372 Cluj-Napoca, Romania
2 Centre for Technology Transfer-BioTech, 64 Calea Florești, 400509 Cluj-Napoca, Romania
3 Department of Communication, Public Relations and Advertising, Babeș-Bolyai University Cluj-Napoca, 71 General Traian Moșoiu Street, 400070 Cluj-Napoca, Romania
4 Department of Marketing, Babeș-Bolyai University Cluj-Napoca, 58-60 Teodor Mihali Street, 400591 Cluj-Napoca, Romania
5 Department of Food Science, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăștur, 400372 Cluj-Napoca, Romania
* Correspondence: dan.dabija@ubbcluj.ro (D.-C.D.); cristina.semeniuc@usamvcluj.ro (C.A.S.); Tel.: +40-740-189-659 (D.-C.D.); +40-264-596-384 (C.A.S.)

Abstract: Contemporary society faces numerous food-related challenges: on the one hand, it is becoming increasingly difficult to ensure that people have access to fresh, nutritious, and safe food products around the world, while on the other hand, consumers from 'low income' countries are starving, while food products are sometimes discarded because it is difficult to prolong shelf-life. To overcome such challenges, edible active films, called biopolymer films, were developed as materials to cover or wrap food products to extend their shelf-life, as they can offer additional protection. Therefore, this article aims to study consumers' preference and loyalty towards the innovative, active, green, and sustainable characteristics of biopolymer films for the active packaging of food products. A quantitative empirical investigation was carried out among consumers in an emerging market, pinpointing their behavior toward such a novel food packaging material. The conceptual model designed was assessed using structural equation modelling. The results show that consumers tend to accept and prefer biopolymer-film packaging, as it maintains the characteristics of the product and thus extends its shelf-life. The results also revealed consumers' openness to eco-sustainable consumption and willingness to pay more for the benefits of this packaging.

Keywords: biopolymer films; coatings; innovative; green; sustainable; active packaging; food products; consumer preference; loyalty

Citation: Socaciu, M.-I.; Câmpian, V.; Dabija, D.-C.; Fogarasi, M.; Semeniuc, C.A.; Podar, A.S.; Vodnar, D.C. Assessing Consumers' Preference and Loyalty towards Biopolymer Films for Food Active Packaging. *Coatings* **2022**, *12*, 1770. https://doi.org/10.3390/coatings12111770

Academic Editor: Stefano Farris

Received: 26 October 2022
Accepted: 17 November 2022
Published: 19 November 2022

1. Introduction

Every year, approximately one-third of the food produced worldwide is not consumed [1]. Microbial and oxidative spoilage are the main factors that contribute to food loss and waste [2], which have significant economic, environmental, and social consequences. Most packaging materials for food applications are derived from petroleum because of their low cost, good barrier properties, and convenience. However, these polymers are not biodegradable and have already raised serious concerns about pollution. Therefore, the current trend in the packaging industry is to replace non-renewable with renewable materials.

Packaging represents an essential aspect of a food product in the final stage of the supply chain, attracting consumers [3] and influencing their purchasing decisions [4,5]. Therefore, it is essential to inform consumers about the benefits of new food packaging, to justify their use instead of conventional ones [6], and to motivate the cost of packaging found in the final price of the product [7,8]. Previous research has investigated food packaging from a producer, business [9,10], consumer [11–13] or technical perspective [14]. However, little consumer-oriented research focuses on their preference and loyalty [15] to biopolymer films, packaging materials that protect food due to their functional properties [16]. Furthermore, biopolymer films are innovative, active, green, and sustainable [17,18], respectively, and they have an attractive price for consumers [16]. Therefore, this paper aims to investigate to what extent their innovative, active, green, and sustainable characteristics can offer protection to food products while generating consumer preference and loyalty to them. Empirical research based on surveys has been carried out among Romanian consumers familiar with social networks. The respondents received an online survey asking them to assess a protein-based packaging material, an edible film prepared with whey protein isolate and tarragon essential oil (see Figure 1). In addition, the main technical characteristics of this biopolymer film were detailed in the first part of the survey.

Figure 1. Protein-based packaging material depicted in the online survey.

From a theoretical perspective, the study is based on the Stimulus (S)–Organism (O)–Response (R) model, one of the breakthroughs regarding biopolymer-film packaging and the extent to which consumers relate to its characteristics. Innovative features of biopolymer-film packaging (intelligent, sustainable, active, and green) offer improved functionalities for producers and customers. Furthermore, these methods are derived from consumers' demand for safer food products with a longer shelf-life. The paper is structured as follows: Section 1 contains a literature review with hypothesis and conceptual model development, which is followed by Section 2 with the research methodology and Section 3 with results and discussions, and the last section, Section 4, concludes with the theoretical and managerial contributions, the limitations, and future research perspectives.

1.1. Literature Review: Hypothesis and Conceptual Model Development

1.1.1. The Stimulus–Organism–Response (SOR) Approach

The Stimulus–Organism–Response (SOR) approach [19] is a broadly used classical theory that seeks to explain consumer behavior patterns. It states that consumer behavior is determined by external stimuli that affect their perceptions, cognitive and emotional responses and generate certain attitudes [20] and behaviors [19]. Based on this theory, the characteristics of biopolymer-film packaging (innovative, active, green, sustainable, and attractive) are considered in this study as an external stimulus (S) that affects consumer internal perceptions (O); that is, consumer preference towards biopolymer films as packaging for food, which determines a behavioral response (R)—in this research, the consumer's response is represented by their loyalty towards biopolymer-film food packaging.

1.1.2. From Traditional Food Packaging to Biopolymer-Film Packaging

Food packaging is constantly evolving to find an equilibrium between consumer demands, environmental concerns, and food safety. The packaging issue is of great importance not only for food producers but also for third-party logistics providers, retailers, consumers, and waste disposal facilities. Seven out of ten customers make a purchase decision on the shelf of the store in approximately 12 s, which is highly influenced by the appearance of the product and implicitly by the package [21,22]. Conventional food packaging represents a passive barrier designed to delay the negative impact of the environment on food. In the new generation of innovative packaging types, intelligent and active packaging are often praised for their unique characteristics and for improving food properties [23–25].

Various biological resources have been used to develop sustainable and biodegradable biopolymers. Protein-based polymers have been extensively investigated in the last decade: milk protein [26], whey protein isolate [27,28], fish protein [29], egg white protein [30], soy protein [31], or gelatin [32]. Polysaccharide-based polymers have also been investigated [33] in relation to quince seed mucilage or chitosan [34–38]. Further research focused on testing starch-based films [39–41] and pectin-based films [42].

Lipids are commonly used to reduce the hydrophilicity and diminish moisture loss; among the lipid components used in this sense are listed natural waxes [43], fatty acids [44], vegetable oils [45], or acetylated glycerides [46]. To improve the functionality of biopolymers, various active agents such as essential oils [27,28,47] or plant extracts [48,49] were introduced into the matrix, due to their antioxidant properties [50] and antimicrobial properties [51]. Nowadays, people pay attention to quality and safety, but also to the price of products. As the packaging cost is found in their final price, introducing a new packaging concept into the market can be challenging [52,53].

Typically, protein-based active films are obtained by pouring and drying film-forming solutions to which active components (antioxidants, plant extracts, polyphenols, and antimicrobial agents) have been added. The functions of edible films include mass transfer control, mechanical protection, and sensory marketing appeal [54]. In addition, active films are biodegradable food-contact materials to which active components are added or incorporated to be released into food. Among the advantages of using edible films on food products are [55]: preservation of physical and chemical quality, convenience of handling, contribution to the product's appearance, and flavor maintenance.

Film requirements depend on which properties of the food need to be protected. Researchers [27,28] designed an edible film based on whey protein isolate incorporated with essential oil, which possesses good mechanical properties, is less soluble in water, and is transparent and protective against visible light. Piccirilli et al. [56] developed an edible film based on whey protein concentrate and liquid smoke with high UV barrier properties, a dark-brown color, a thickness below 0.25 mm and good mechanical properties. Taghinia et al. [57] produced edible films based on curcumin-incorporated *Lallemantia iberica* seed mucilage, with good gas-diffusion barrier properties, low water vapor permeability, poor water solubility, and enhanced mechanical properties. Since the edible film can be consumed with the food product, the packaging must not interfere with its organoleptic properties. Generally, the concentration of active agents required for the effectiveness of an edible film is very low; therefore, its impact on taste [58] is insignificant [59].

Innovative smart packaging solutions improve the quality and safety of the food supply, ensuring better traceability and minimizing food waste [60]. On the other hand, consumer needs and requirements strongly influence continuous packaging innovation in the food sector; therefore, in the late twentieth century, sustainable, intelligent, and active packaging material was highlighted [25,61]. Furthermore, depending on the type of product subjected to packaging, "smartness" can refer to various functionalities, including maintaining product attributes and shelf-life and providing convenience and security. Therefore, we can hypothesize that:

Hypothesis 1 (H_1). *Innovative packaging exerts a positive influence on consumers' preference toward the biopolymer-film food packaging.*

Active packaging solutions can help reduce the amount of food waste by offering numerous functions related to food preservation, such as scavenging/releasing properties, temperature, microbiological and quality controls [23]; moisture control, prevention of oxidation, antimicrobial activity, and gas barrier properties extend the shelf-life of packaged foods and directly impact the sustainability of the food supply. Furthermore, in most cases of active films created, the active part was provided by the incorporation of various bioactive compounds such as plant extracts, phytochemicals, probiotic microorganisms, or enzymes [28,38,47,62,63]. Based on these arguments, we infer that:

Hypothesis 2 (H_2). *Active packaging has a strong positive influence on consumers' preference for biopolymer film.*

Green packaging, also known as 'eco-friendly', 'sustainable', or 'recyclable packaging', uses renewable materials or is biodegradable and is compatible with environmental and safety concerns. Companies are motivated to promote green packaging for several reasons: the awareness of consumers about the environmental impact, government regulations and laws, taxation, and recycling [10]. Furthermore, green packaging is made of biodegradable materials, manufactured from fibers from animals, plants, or other organisms, is recyclable [64], promotes sustainable development [65] and is therefore safe for the environment, human body, and animals [8,66]. Consumers prefer these, although certain impediments may hinder their decision [67,68] to choose green packaging [69,70]: lack of guidance in the decision-making process, lack of knowledge on the importance of such packaging for environmental protection, and finally the fact that other characteristics (price, product quality) take precedence over green packaging. Considering all these arguments, we posit that:

Hypothesis 3 (H_3). *Green packaging generates consumer preference for food packaging.*

Sustainable packaging uses renewable biological resources to create innovative packaging. Biopolymers can be derived from microorganisms, plant biomass, or by-products from the food industry [24,25,71], and can be based on proteins, lipids or polysaccharides. Packaging development from renewable resources is a complementary direction to reduce packaging waste [21]. Biodegradable polymers are one of the most progressive systems for the upcoming generation of sustainable packaging, offering an improved gas and water vapor seal and stable mechanical qualities [72]. Compared to traditional packaging, sustainable packaging meets environmental, social, and economic requirements and simultaneously opens possibilities for waste recovery and disposal [73]. In addition, it can lead to sustainable consumer behavior even after consumption [74]. Therefore, we postulate that:

Hypothesis 4 (H_4). *Sustainable packaging has a positive influence on consumers' preference toward biopolymer-film food packaging.*

The price is an important aspect for consumers, and it should be well balanced with price sensitivity. According to a study on consumer buying expectations for active and intelligent packaging [75], 75% of the respondents agreed to pay a little more for packaging containing active ingredients and more than 80% for intelligent packaging. In consumer perception, active packaging is oriented toward shelf-life prolongation, while intelligent packaging is oriented towards the interaction between manufacturer and client (information on the quality, storage, and monitoring conditions of the product) [76–78]. Similar results show that 73% of consumers in the 11 countries surveyed were willing to pay extra for eco-friendly packaging [79]. They also found that consumers' attitude towards green packaging and brands strongly influences their availability to pay more [79]. Furthermore, consumers who feel intense social pressure to conserve the environment by using sustainable packaging or proper packaging disposal are more likely to buy food packaged in sustainable materials [80–82]. In this vein, we consider the following:

Hypothesis 5 (H_5). *Attractive packaging price exerts a positive influence on consumers' preference toward biopolymer-film food packaging.*

Packaging has functional and social functions [83]: it connects the client to the manufacturer, encourages purchase loyalty [84] and ensures the product's security during handling, transportation, and storage. Packaging is an essential element of the image of the product and can determine consumers' opinions about the quality of the product, which becomes a critical factor in sustaining consumer trust and loyalty [85]. To retain consumer loyalty, the packaging of the product should be consistent with their needs and expectations [86]. Developing packaging based on consumer preferences could increase long-term consumer loyalty if a desirable product and brand image are achieved [87,88]. Therefore, we argue that:

Hypothesis 6 (H_6). *Consumer preference for food packaging generates loyalty to this packaging material.*

Based on theoretical developments, the conceptual model from Figure 2 is proposed.

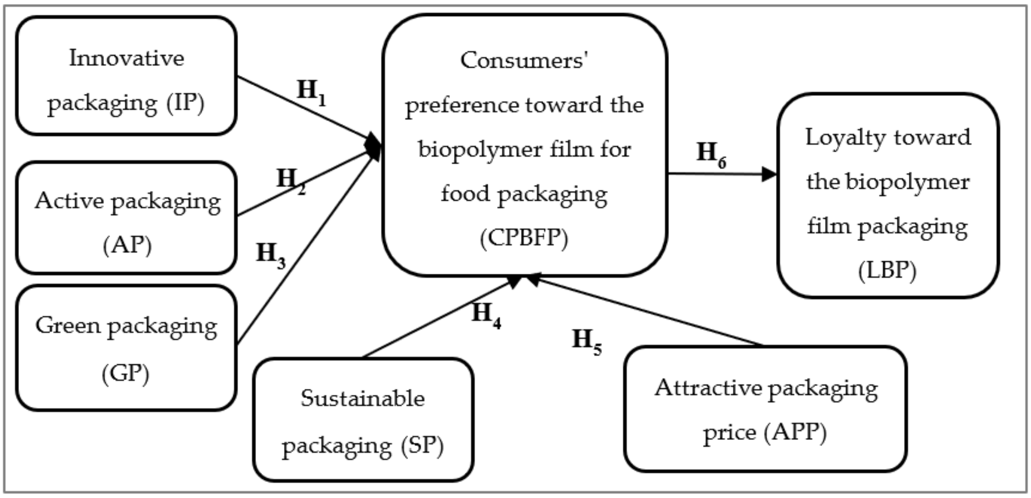

Figure 2. Conceptual model: Generating loyalty towards a biopolymer-film packaging.

2. Research Methodology

2.1. Research Design

This study aimed to determine the preference and loyalty regarding biopolymer-film packaging, which protects food products due to its peculiar characteristics; protein-based packaging is innovative, active, green, and sustainable and has an attractive price tag for consumers (see Figure 2).

2.2. Sampling and Data Collection

The research was carried out as an empirical investigation using a quantitative survey implemented through online interviews conducted by authors via social networks; convenience sampling was applied to reach a wider pool of participants. In this regard, respondents were asked to specify the extent to which this packaging type, namely biopolymer film, seems attractive to them, and whether they would buy it/prefer it due to its technical and organoleptic properties, which protect the food product and extend its shelf-life.

Since this packaging material is a prototype, not used on an industrial scale for food packaging, respondents were informed about the biopolymer-film packaging before completing the survey, including that it is used for covering food products to prolong their shelf-life. Furthermore, respondents were told that the packaging is edible, that it can be consumed with the food product on which it was applied or that it can be removed before consumption. The preservation effect of the edible biopolymer-film packaging is due to the active ingredient incorporated (for instance, essential oil for internal use), which gives it antimicrobial and/or antioxidant properties. This active packaging material is obtained from whey protein isolate (for the formation of protective films), tarragon essential oil (for the antioxidant and antimicrobial effects), glycerol (as a plasticizer), and water. Furthermore, respondents were shown an image with this packaging material applied to a fish burger (see Figure 3). In total there were 577 participants in the study: 147 men (25.5%) and 430 women (74.5%). Furthermore, 188 respondents (32.6%) graduated high school and are currently pursuing specialized studies, 360 (62.4%) hold a bachelor's degree, work in their field and are following a master's program, while 29 (5.1%) have professional and post-secondary studies.

Figure 3. Active packaging (left side, fish burger covered with biopolymer film based on whey protein isolate with tarragon essential oil) versus conventional packaging (right side, uncovered fish burger).

3. Results and Discussions

Evaluation of measurement models. Through SmartPLS 3.0. [89], the conceptual model depicted in Figure 1 was examined using the structural equation model (SEM) to investigate hypotheses deduced from the literature review. All reflective constructs were tested for validity and internal consistency, and item loadings, average variance extracted (AVE), reliability indicators, and discriminant validity were calculated and are presented in Table 1. As can be observed, all loadings are above the minimum threshold of 0.70, allowing us to confirm that the measured items have convergence validity [90]. The minimum and maximum values of the item loadings lie between 0.793 and 0.920, above the minimum recommended value of 0.7. Reliability was tested using Cronbach's α, whose values must be greater than 0.7, as specified in the literature [91]; all envisaged constructs meet this stringency criterion, as the test results exceed the reference value. However, the AVE exceeds the threshold value of 0.5 for all constructs, showing that the model is valid [92], while all constructs have convergence validity. Furthermore, the composite reliability (CR) for the model constructs in Figure 1 is above the threshold value of 0.7, indicating the reliability of the construct [90].

Table 1. Constructs and items.

Item	Measure	Loading	Cronbach's α	AVE	CR
	Innovative Packaging (IP), adapted from [93–95]				
IP1	From a technical perspective, edible protein-based biopolymer-film packaging is innovative	0.888	0.937	0.759	0.950
IP2	From a technical perspective, edible protein-based biopolymer-film packaging is intelligent	0.890			
IP3	From a technical perspective, edible protein-based biopolymer-film packaging is new	0.877			
IP4	From a technical perspective, edible protein-based biopolymer-film packaging is an extraordinary breakthrough	0.856			
IP5	From a technical perspective, edible protein-based biopolymer-film packaging is made thanks to technological progress	0.872			
IP6	From a technical perspective, edible protein-based biopolymer-film packaging is a cutting-edge product	0.844			
	Active Packaging (AP), adapted from [93,94]				
AP1	Protects the food product against pathogenic agents	0.920	0.899	0.832	0.937
AP2	AP helps me maintain my health	0.903			
AP23	AP inhibits microbial growth	0.914			
	Green Packaging (GP), adapted from [96]				
GP1	GP contributes to the reduction of waste accumulation	0.863	0.926	0.771	0.944
GP2	. . . is biodegradable	0.903			
GP3	. . . is compostable	0.867			
GP4	. . . is non-polluting	0.884			
GP5	. . . is made of natural ingredients	0.873			
	Attractive Packaging Price (APP), adapted from [97,98]				
APP1	The price tag of the edible packaging is good for me	0.889	0.911	0.738	0.934
APP2	. . . is fair	0.886			
APP3	. . . is scientifically supported	0.827			
APP4	. . . helps me save time	0.857			
APP5	. . . helps me save money, as it extends shelf-life	0.833			
	Sustainable Packaging (SP), adapted from [76,96]				
SP1	. . . is green/bio/eco-friendly/organic	0.805	0.900	0.665	0.923
SP2	. . . helps reduce food waste	0.818			
SP3	. . . helps me recycle	0.794			
SP4	. . . helps me sort waste	0.793			
SP5	. . . protects nature	0.843			
SP6	. . . decomposes quickly	0.839			
	Consumer Preference for Food Packaging (CPBFP), adapted from [96,99,100]				
CPBFP1	I would prefer that the food products I buy have active and edible packaging, as it maintains the product quality	0.892	0.934	0.791	0.950
CPBFP2	. . . ensures food safety	0.880			
CPBFP3	. . . stirs me positive emotions	0.865			
CPBFP4	. . . makes me want to buy the food product	0.910			
CPBFP5	. . . determines me to try the food product	0.897			
	Loyalty toward Biopolymer-film Packaging (LBP), adapted from [99–101]				
LBP1	I will prefer only food products with edible packaging	0.810	0.933	0.750	0.947
LBP2	I will prefer food products with edible packaging over conventional ones	0.881			
LBP3	I will buy food products with edible packaging	0.889			
LBP4	I will speak favorably to my friends and acquaintances about edible packaging	0.890			
LBP5	I will be willing to buy food products with edible packaging	0.879			
LBP6	I will buy food products with edible packaging, even if their price is 5 lei higher	0.844			

AVE average variance extracted; CR-composite reliability.

The discriminant validity for each dimension was verified by applying the Fornell–Larcker and Heterotrait–Monotrait (HTMT) criteria (see Table 2). According to the first criterion, all recommended thresholds are met [102], so further HTMT criteria were applied. It has been proven that the constructs are not conceptually equal, the thresholds being under 0.9 [102]. The results of discriminant validity using both criteria show that the stringency thresholds recommended by the literature are met, indicating the discriminant validity of the constructs.

Table 2. Discriminant validity results.

Fornell–Larcker							Construct	Heterotrait–Monotrait (HTMT)						
AP	**CPBFP**	**APP**	**GP**	**IP**	**LBP**	**SP**		**AP**	**CPBFP**	**APP**	**GP**	**IP**	**LBP**	**SP**
0.912							AP							
0.691	0.889						CPBFP	0.754						
0.615	0.675	0.859					APP	0.678	0.728					
0.593	0.663	0.508	0.878				GP	0.647	0.710	0.546				
0.728	0.665	0.546	0.699	0.871			IP	0.791	0.709	0.586	0.749			
0.617	0.677	0.800	0.532	0.564	0.866		LBP	0.674	0.722	0.869	0.566	0.595		
0.687	0.696	0.616	0.810	0.666	0.620	0.816	SP	0.756	0.749	0.672	0.879	0.717	0.670	

AP—Active Packaging; CPBFP—Consumers' preference toward the biopolymer film for food packaging; APP—Attractive packaging price; GP—Green packaging; IP—Innovative packaging; LBP—Loyalty toward the biopolymer-film packaging; SP—Sustainable packaging.

Next, the level of collinearity for the datasets in the measurement model was discussed. The values of the variation inflation factor (VIF) for all indicators are below 5, considered the threshold in collinearity analysis [103]; the highest value is 4.297 (BPBP4 item), indicating no multicollinearity. Next, a bootstrap procedure was performed to test the hypotheses and relationships between the latent variables; based on the resulting T-values, six hypotheses with a significant positive relationship were accepted.

Evaluation of structural models. To thoroughly evaluate the structural model, we examined the collinearity of the constructs. The highest VIF value of the internal model is 3.859 (SP $\rightarrow$ CPBFP), thus below the threshold value, indicating that there is no multicollinearity between constructs. As the goodness of fit (SRMR) with a value of 0.052 is under the recommended value of <0.08, the saturated model needs to be properly developed. Furthermore, IP, AP, GP, SP and APP explain 64.9% of the variance in BPBP (R2 = 0.649), and CPBFP explains 45.9% of the variance in LBP (R2 = 0.459), indicating the strong prediction power of the structural model (see Figure 4).

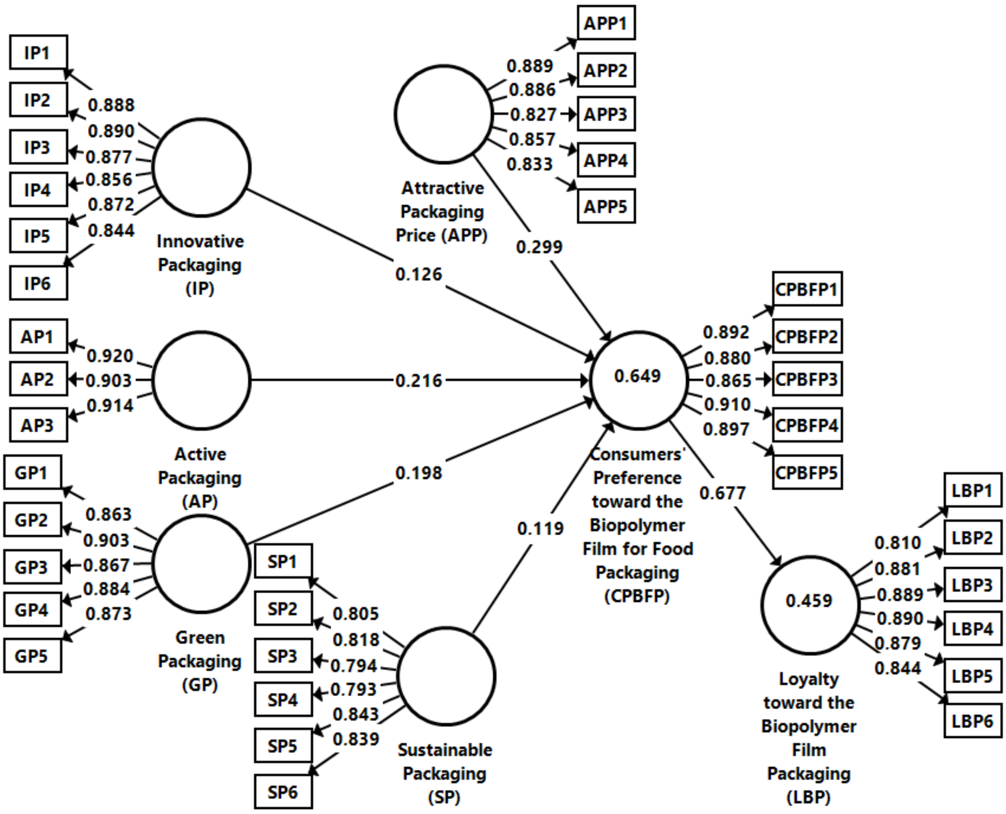

Figure 4. Structural model.

Table 3 contains the hypothesis testing findings. H_1 inferred that IP exerts a positive influence on CPBFP. The values of β (0.126), T (2.599) and *p* (0.010) demonstrate the moderate, positive, and significant meaning; therefore, H_1 is supported. H_2 assumed that AP has a strong positive influence on CPBFP. The resulting values (β = 0.216; T = 4.950; $p < 0.001$) confirm a meaningfully positive and significant relationship between these two dimensions; therefore, H_2 is supported.

Table 3. Path coefficients of the structural equation model.

Paths	Path Coefficients	Standard Deviation	T-Value	Confidence Interval #	*p*-Value	Hypotheses
IP → CPBFP	0.126	0.049	2.599	0.035~0.219	0.010 *	H_1-Accepted
AP → CPBFP	0.216	0.044	4.950	0.125~0.302	0.000 **	H_2-Accepted
GP → CPBFP	0.198	0.052	3.793	0.089~0.301	0.000 **	H_3-Accepted
SP → CPBFP	0.119	0.054	2.188	0.016~0.227	0.029 *	H_4-Accepted
APP → CPBFP	0.299	0.042	7.116	0.209~0.372	0.000 **	H_5-Accepted
CPBFP → LBP	0.677	0.030	22.567	0.620~0.736	0.000 **	H_6-Accepted

IP—Innovative packaging; CPBFP—Consumer preference towards biopolymer film for food packaging; AP—Active packaging; GP—Green packaging; SP—Sustainable packaging; APP—Attractive packaging price; LBP—Loyalty toward the biopolymer-film packaging; * $p < 0.01$; ** $p < 0.001$; # 2.5%–97.5%.

H_3 assumed that GP generates CPBFP. Results (β = 0.198; T = 3.793; $p < 0.001$) prove that the relationship is moderately influenced, but is still positive and significantly strong, allowing us to support H_3. H_4 assumed that SP has a positive impact on CPBFP. Results (β = 0.119; T = 2.188; $p = 0.029$) show the moderate positive and significant influence of SP on CPBFP; therefore, H_3 is empirically supported.

H_5 assumed that APP positively influences CPBFP (see Table 3). Results (β = 0.299; T = 7.116; $p < 0.001$) show a strong positive and significant relationship between the two constructs; therefore, H_5 is accepted. H_6 inferred that CPBFP generates LBP. Results (β = 0.677; T = 22.567; $p < 0.001$) show a very strong positive and significant relation between the two constructs; therefore, H_6 is accepted.

Packaging represents one of the critical features of a product [76], the most frequent aspect of consumption [104]. A well-packaged product can be a warranty of consumer welfare [76]. At the same time, packaging protects goods from degradation [4] and can also affect the willingness to buy a product [5]. Packaging is also known to protect the product from external deterioration [105].

Packaging has changed significantly in recent years because of the public's free access to information; being aware, consumers demand packaging that meets their needs and requirements [76]. The fact that the food packaging industry has increasingly adapted to these requirements is also driven by changes in consumer lifestyles and the growing demand for safe food [106]; another critical factor is the environmental concern and the social pressure consumers experience regarding environmental protection and conservation [82]. Therefore, they seek packaging made from recycled materials that produces less waste and that, when emptied, can be recycled [107].

The study revealed the preference for food packaging based on innovative materials, which not only protects the food product but also extends its shelf-life, and is environmentally friendly and/or recyclable. Previous reports [108–110] have shown that the latest breakthroughs in food packaging are related to the development of intelligent and active packaging, as well as biodegradable polymers and edible films. Our results are consistent with these findings and highlight that consumers are aware of the benefits of these innovative packaging solutions in the preservation of food products and offer new opportunities for maintaining food quality.

Additionally, consumers' preference for these new technologies [111] in the packaging industry reflects their awareness and concern for environmental and waste-management issues. These results confirm previous findings [112], showing that consumers will demand and choose green and sustainable packaging due to their openness to eco-sustainable consumption. Furthermore, they are willing to pay more for better quality products that provide them with more benefits, thus illustrating a mindset that promotes the principles of sustainability and environmental protection [113,114]. Sustainability has become one of the main requirements for packaging; the use of biopolymers to produce packaging materials can help reduce food waste and ensure sustainability. Similar results also indicated that consumers value sustainable packaging due to advantages such as natural appeal and potential for recycling [107].

Consumer preferences for and perceptions of something novel and innovative, such as these packaging materials, can determine the further evolution of the food product. To be successful, it is essential to investigate the degree of consumer acceptance and openness towards these novelties [115]. Our research clearly shows consumers' openness to innovative, active, environmentally friendly, and sustainable packaging, and their preference for biopolymer film for food packaging. By understanding the benefits of the packaging material in preserving the product and extending shelf-life, consumers are inclined to pay more. As previously highlighted [116], packaging material can drive the intention and willingness to purchase a product.

4. Conclusions

Through the proposed Stimulus–Organism–Response (SOR) approach, this study explored the influence of packaging characteristics on consumer internal perceptions, impacting their decision to choose biopolymer film for food packaging and to show loyalty to this packaging material. The results of this study showed consumers' preference for biopolymer-film packaging because it preserves product characteristics and extends shelf-life. Consumers' openness to new and innovative packaging technologies that have an impact on environmental protection and waste management was also noted. Last but not least, the study revealed consumers' attitudes towards green and sustainable consumption, thus highlighting their pro-sustainability and responsible purchasing behavior.

Companies and decision-makers could support and encourage information campaigns to raise consumer awareness of the negative environmental impact of packaging waste and thus encourage behavioral changes towards more sustainable purchasing choices. Despite many advantages, edible films are manufactured only on a laboratory scale because of high costs, processing issues, and feasibility in the current market. Implementation in business-to-consumer environments is difficult due to existing infrastructures, costs, benefits for stakeholders, and consumer perception.

Future research could also consider the opinion of different beneficiaries from the food packaging industry and/or investigate comparative perspectives between consumers from various regional and/or educational backgrounds. Furthermore, a comparative cross-national study among different generations regarding how they relate to such food packaging could also be of interest. Finally, it would be feasible to implement comparative studies on the perception of sustainable and environmentally friendly food packaging compared to conventional food packaging.

Author Contributions: Conceptualization, C.A.S. and D.-C.D.; methodology, C.A.S. and D.-C.D.; software, D.-C.D.; validation, C.A.S. and D.-C.D.; formal analysis, C.A.S. and D.-C.D.; investigation, C.A.S., D.-C.D., M.-I.S., M.F. and D.C.V.; resources, A.S.P., C.A.S., D.-C.D., D.C.V., M.-I.S., M.F. and V.C.; data curation, A.S.P., C.A.S., D.-C.D., D.C.V., M.-I.S. and M.F.; writing—original draft preparation, C.A.S., D.-C.D., M.-I.S. and V.C.; writing—review and editing, C.A.S. and D.-C.D.; visualization, C.A.S. and D.-C.D.; supervision, C.A.S. and D.-C.D.; project administration, D.-C.D.; funding acquisition, D.-C.D. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by a grant of the Romanian Ministry of Education and Research, CNCS—UEFISCDI, project number PN-III-P1-1.1-TE-2021-0795, within PNCDI III.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding authors.

Acknowledgments: The authors would like to thank Ioana Rednic for helping distribute the online survey, but also to all respondents that completed the survey.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Motelica, L.; Ficai, D.; Ficai, A.; Oprea, O.C.; Kaya, D.A.; Andronescu, E. Biodegradable antimicrobial food packaging: Trends and perspectives. *Foods* **2020**, *9*, 1438. [CrossRef] [PubMed]
2. Lăzăroiu, G.; Valaskova, K.; Nica, E.; Durana, P.; Kral, P.; Bartoš, P.; Maroušková, A. Techno-economic assessment: Food emulsion waste management. *Energies* **2020**, *13*, 4922. [CrossRef]
3. Rydell, L.; Suler, P. Underlying values that motivate behavioral intentions and purchase decisions: Lessons from the COVID-19 pandemic. *Anal. Metaphys.* **2021**, *20*, 116–129. [CrossRef]
4. Alhamdi, F.M. Role of packaging in consumer buying behavior. *Manag. Sci. Lett.* **2020**, *10*, 1191–1196. [CrossRef]
5. Saha, S.P. Impact of product packaging on consumer buying decision. *J. Eng. Sci. Res.* **2020**, *4*, 17–22. [CrossRef]
6. Majid, I.; Nayik, G.A.; Dar, S.M.; Nanda, V. Novel food packaging technologies: Innovations and future prospective. *J. Saudi Soc. Agric. Sci.* **2018**, *17*, 454–462. [CrossRef]
7. Mishra, P.; Jain, T.; Motiani, M. Have green, pay more: An empirical investigation of consumer's attitude towards green packaging in an emerging economy. In *Essays on Sustainability and Management*; Sarkar, R., Shaw, A., Eds.; India Studies in Business and Economics; Springer: Singapore, 2017; pp. 125–150. [CrossRef]
8. Pan, C.; Lei, Y.; Wu, J.; Wang, Y. The influence of green packaging on consumers' green purchase intention in the context of online-to-offline commerce. *J. Syst. Inf. Technol.* **2021**, *23*, 133–153. [CrossRef]
9. Diggle, A.; Walker, T.R. Implementation of harmonized Extended Producer Responsibility strategies to incentivize recovery of single-use plastic packaging waste in Canada. *Waste Manag.* **2020**, *110*, 20–23. [CrossRef]
10. Wandosell, G.; Parra-Meroño, M.C.; Alcayde, A.; Baños, R. Green packaging from consumer and business perspectives. *Sustainability* **2021**, *13*, 1356. [CrossRef]
11. Han, J.W.; Ruiz-Garcia, L.; Qian, J.-P.; Yang, X.-T. Food packaging: A comprehensive review and future trends. *Compr. Rev. Food Sci. Food Saf.* **2018**, *17*, 860–877. [CrossRef]

12. Mruk-Tomczak, D.; Jerzyk, E.; Wawrzynkiewicz, N. Consumer engagement and the perception of packaging information. *Olszt. Econ. J.* **2019**, *14*, 195–207. [CrossRef]
13. Young, E.; Mirosa, M.; Bremer, P. A systematic review of consumer perceptions of smart packaging technologies for food. *Front. Sustain. Food Syst.* **2020**, *4*, 63. [CrossRef]
14. Pal, M.; Devrani, M.; Hadush, A. Recent developments in food packaging technologies. *Beverage Food World* **2019**, *46*, 21–25.
15. Lăzăroiu, G.; Andronie, M.; Uţă, C.; Hurloiu, I. Trust management in organic agriculture: Sustainable consumption behavior, environmentally conscious purchase intention, and healthy food choices. *Front. Public Health* **2019**, *7*, 340. [CrossRef] [PubMed]
16. Socaciu, M.-I.; Semeniuc, C.A.; Vodnar, D.C. Edible films and coatings for fresh fish packaging: Focus on quality changes and shelf-life extension. *Coatings* **2018**, *8*, 366. [CrossRef]
17. Majerova, J.; Sroka, W.; Krizanova, A.; Gajanova, L.; Lăzăroiu, G.; Nadanyiova, M. Sustainable brand management of alimentary goods. *Sustainability* **2020**, *12*, 556. [CrossRef]
18. Skvarciany, V.; Lapinskaite, I.; Volskyte, G. Circular economy as assistance for sustainable development in OECD countries. *Oeconomia Copernic.* **2021**, *12*, 11–34. [CrossRef]
19. Mehrabian, A.; Russell, J.A. *An Approach to Environmental Psychology*; M.I.T. Press: Cambridge, MA, USA, 1974.
20. Hopkins, E.; Potcovaru, A.-M. Consumer attitudes, values, needs, and expectations due to COVID-19. *Anal. Metaphys.* **2021**, *20*, 202–215. [CrossRef]
21. Cichocka, I.; Krupa, J.; Mantaj, A. The consumer awareness and behaviour towards food packaging in Poland. *Econ. Sociol.* **2020**, *13*, 304–317. [CrossRef]
22. Valaskova, K.; Durana, P.; Adamko, P. Changes in Consumers' Purchase Patterns as a Consequence of the COVID-19 Pandemic. *Mathematics* **2021**, *9*, 1788. [CrossRef]
23. Vilela, C.; Kurek, M.; Hayouka, Z.; Röcker, B.; Yildirim, S.; Antunes, M.D.C.; Nilsen-Nygaard, J.; Pettersen, M.K.; Freire, C.S.R. A concise guide to active agents for active food packaging. *Trends Food Sci. Technol.* **2018**, *80*, 212–222. [CrossRef]
24. Robertson, G.L. History of food packaging. In *Reference Module in Food Science*; Elsevier: Amsterdam, The Netherlands, 2019. [CrossRef]
25. Martins, V.G.; Romani, V.P.; Martins, P.C.; da Silva Filipini, G. Innovative packaging that saves food. In *Saving Food: Production, Supply Chain, Food Waste and Food Consumption*; Galanakis, C.M., Ed.; Academic Press: Amsterdam, The Netherlands, 2019; pp. 171–202. [CrossRef]
26. Shendurse, A.M.; Gopikrishna, G.; Patel, A.C.; Pandya, A.J. Milk protein based edible films and coatings–preparation, properties and food applications. *J. Nutr. Health Food Eng.* **2018**, *8*, 219–226. [CrossRef]
27. Socaciu, M.-I.; Fogarasi, M.; Semeniuc, C.A.; Socaci, S.A.; Rotar, M.A.; Mureşan, V.; Pop, O.L.; Vodnar, D.C. Formulation and characterization of antimicrobial edible films based on whey protein isolate and tarragon essential oil. *Polymers* **2020**, *12*, 1748. [CrossRef]
28. Socaciu, M.-I.; Fogarasi, M.; Simon, E.L.; Semeniuc, C.A.; Socaci, S.A.; Podar, A.S.; Vodnar, D.C. Effects of whey protein isolate-based film incorporated with tarragon essential oil on the quality and shelf-life of refrigerated brook trout. *Foods* **2021**, *10*, 401. [CrossRef] [PubMed]
29. Pires, C.; Ramos, C.; Teixeira, B.; Batista, I.; Nunes, M.L.; Marques, A. Hake proteins edible films incorporated with essential oils: Physical, mechanical, antioxidant and antibacterial properties. *Food Hydrocoll.* **2013**, *30*, 224–231. [CrossRef]
30. Kavas, N.; Kavas, G. Physical-chemical and antimicrobial properties of egg white protein powder films incorporated with orange essential oil on Kashar cheese. *Food Sci. Technol. Camp.* **2016**, *36*, 672–678. [CrossRef]
31. González, A.; Igarzabal, C.I.A. Soy protein—Poly (lactic acid) bilayer films as biodegradable material for active food packaging. *Food Hydrocoll.* **2013**, *33*, 289–296. [CrossRef]
32. Luo, Q.; Hossen, M.A.; Zeng, Y.; Dai, J.; Li, S.; Qin, W.; Liu, Y. Gelatin-based composite films and their application in food packaging: A review. *J. Food Eng.* **2022**, *313*, 110762. [CrossRef]
33. Jouki, M.; Yazdi, F.T.; Mortazavi, S.A.; Koocheki, A. Quince seed mucilage films incorporated with oregano essential oil: Physical, thermal, barrier, antioxidant and antibacterial properties. *Food Hydrocoll.* **2014**, *36*, 9–19. [CrossRef]
34. Martins, J.T.; Cerqueira, M.A.; Vicente, A.A. Influence of α-tocopherol on physicochemical properties of chitosan-based films. *Food Hydrocoll.* **2012**, *27*, 220–227. [CrossRef]
35. Bonilla, J.; Atarés, L.; Vargas, M.; Chiralt, A. Effect of essential oils and homogenization conditions on properties of chitosan-based films. *Food Hydrocoll.* **2012**, *26*, 9–16. [CrossRef]
36. Leceta, I.; Guerrero, P.; Ibarburu, I.; Dueñas, M.T.; de la Caba, K. Characterization and antimicrobial analysis of chitosan-based films. *J. Food Eng.* **2013**, *116*, 889–899. [CrossRef]
37. Tan, W.; Dong, F.; Zhang, J.; Zhao, X.; Li, Q.; Guo, Z. Physical and antioxidant properties of edible chitosan ascorbate films. *J. Agric. Food Chem.* **2019**, *67*, 2530–2539. [CrossRef]
38. Gaba, A.B.M.; Hassan, M.A.; Abd EL-Tawab, A.A.; Abdelmonem, M.A.; Morsy, M.K. Protective impact of chitosan film loaded oregano and thyme essential oil on the microbial profile and quality attributes of beef meat. *Antibiotics* **2022**, *11*, 583. [CrossRef] [PubMed]
39. Abreu, A.S.; Oliveira, M.; de Sá, A.; Rodrigues, R.M.; Cerqueira, M.A.; Vicente, A.A.; Machado, A.V. Antimicrobial nanostructured starch-based films for packaging. *Carbohydr. Polym.* **2015**, *129*, 127–134. [CrossRef] [PubMed]

40. Luchese, C.L.; Benelli, P.; Spada, J.C.; Tessaro, I.C. Impact of the starch source on the physicochemical properties and biodegradability of different starch-based films. *J. Appl. Polym. Sci.* **2018**, *135*, 46564. [CrossRef]
41. Júnior, L.M.; de Ávila Gonçalves, S.; da Silva, R.G.; Martins, J.T.; Vicente, A.A.; Alves, R.M.V.; Vieira, R.P. Effect of green propolis extract on functional properties of active pectin-based films. *Food Hydrocoll.* **2022**, *131*, 107746. [CrossRef]
42. Guadarrama-Lezama, A.Y.; Castaño, J.; Velázquez, G.; Carrillo-Navas, H.; Alvarez-Ramírez, J. Effect of nopal mucilage addition on physical, barrier and mechanical properties of citric pectin-based films. *J. Food Sci. Technol.* **2018**, *55*, 3739–3748. [CrossRef]
43. Galus, S.; Kadzińska, J. Food applications of emulsion-based edible films and coatings. *Trends Food Sci. Technol.* **2015**, *45*, 273–283. [CrossRef]
44. Jiménez, A.; Fabra, M.J.; Talens, P.; Chiralt, A. Effect of re-crystallization on tensile, optical and water vapour barrier properties of corn starch films containing fatty acids. *Food Hydrocoll.* **2012**, *26*, 302–310. [CrossRef]
45. Cerqueira, M.A.; Souza, B.W.S.; Teixeira, J.A.; Vicente, A.A. Effect of glycerol and corn oil on physicochemical properties of polysaccharide films—A comparative study. *Food Hydrocoll.* **2012**, *27*, 175–184. [CrossRef]
46. Shit, S.C.; Shah, P.M. Edible polymers: Challenges and opportunities. *J. Polym.* **2014**, *2014*, 427259. [CrossRef]
47. Cestari, L.A.; da Silva Scapim, M.R.; Madrona, G.S.; Yamashita, F.; Biondo, P.B.F.; Carvalho, V.M.; Bonin, E.; do Prado, I.N. Production, antioxidant characterization and application of active starch-based films containing essential oils for beef packaging. *Res. Soc. Dev.* **2021**, *10*, e4310816903. [CrossRef]
48. Ganiari, S.; Choulitoudi, E.; Oreopoulou, V. Edible and active films and coatings as carriers of natural antioxidants for lipid food. *Trends Food Sci. Technol.* **2017**, *68*, 70–82. [CrossRef]
49. Hashemi, S.M.B.; Jafarpour, D. The efficacy of edible film from Konjac glucomannan and saffron petal extract to improve shelf life of fresh-cut cucumber. *Food Sci. Nutr.* **2020**, *8*, 3128–3137. [CrossRef] [PubMed]
50. Semeniuc, C.A.; Socaciu, M.-I.; Socaci, S.A.; Mureșan, V.; Fogarasi, M.; Rotar, A.M. Chemometric comparison and classification of some essential oils extracted from plants belonging to Apiaceae and Lamiaceae families based on their chemical composition and biological activities. *Molecules* **2018**, *23*, 2261. [CrossRef] [PubMed]
51. Semeniuc, C.A.; Pop, C.R.; Rotar, A.M. Antibacterial activity and interactions of plant essential oil combinations against Gram-positive and Gram-negative bacteria. *J. Food Drug Anal.* **2017**, *25*, 403–408. [CrossRef]
52. Nemes, S.A.; Szabo, K.; Vodnar, D.C. Applicability of agro-industrial by-products in intelligent food packaging. *Coatings* **2020**, *10*, 550. [CrossRef]
53. Glogovețan, A.-I.; Dabija, D.-C.; Fiore, M.; Pocol, C.B. Consumer Perception and Understanding of European Union Quality Schemes: A Systematic Literature Review. *Sustainability* **2022**, *14*, 1667. [CrossRef]
54. Chen, H. Functional properties and applications of edible films made of milk proteins. *J. Dairy Sci.* **1995**, *78*, 2563–2583. [CrossRef]
55. Han, J.H. Edible films and coatings: A review. In *Innovations in Food Packaging*, 2nd ed.; Han, J.H., Ed.; Academic Press: Amsterdam, The Netherlands, 2014; pp. 213–255. [CrossRef]
56. Piccirilli, G.N.; Soazo, M.; Pérez, L.M.; Delorenzi, N.J.; Verdini, R.A. Effect of storage conditions on the physicochemical characteristics of edible films based on whey protein concentrate and liquid smoke. *Food Hydrocoll.* **2018**, *87*, 221–228. [CrossRef]
57. Taghinia, P.; Abdolshahi, A.; Sedaghati, S.; Shokrollahi, B. Smart edible films based on mucilage of lallemantia iberica seed incorporated with curcumin for freshness monitoring. *Food Sci. Nutr.* **2021**, *9*, 1222–1231. [CrossRef]
58. Smith, A.; Machova, V. Consumer tastes, sentiments, attitudes, and behaviors related to COVID-19. *Anal. Metaphys.* **2021**, *20*, 145–158. [CrossRef]
59. Zhao, Y.; McDaniel, M. Sensory quality of foods associated with edible film and coating systems and shelf-life extension. In *Innovations in Food Packaging*, 1st ed.; Han, J.H., Ed.; Academic Press: Amsterdam, The Netherlands, 2005; pp. 434–453. [CrossRef]
60. Chen, S.; Brahma, S.; Mackay, J.; Cao, C.; Aliakbarian, B. The role of smart packaging system in food supply chain. *J. Food Sci.* **2020**, *85*, 517–525. [CrossRef] [PubMed]
61. Brody, A.L.; Bugusu, B.; Han, J.H.; Sand, C.K.; McHugh, T.H. Innovative food packaging solutions. *J. Food Sci.* **2008**, *73*, R107–R116. [CrossRef]
62. Di Pierro, P.; Chico, B.; Villalonga, R.; Mariniello, L.; Damiao, A.E.; Masi, P.; Porta, R. Chitosan−whey protein edible films produced in the absence or presence of transglutaminase: Analysis of their mechanical and barrier properties. *Biomacromolecules* **2006**, *7*, 744–749. [CrossRef]
63. Vidal, O.L.; Barros Santos, M.C.; Batista, A.P.; Andrigo, F.F.; Baréa, B.; Lecomte, J.; Figueroa-Espinoza, M.C.; Gontard, N.; Villeneuve, P.; Guillard, V.; et al. Active packaging films containing antioxidant extracts from green coffee oil by-products to prevent lipid oxidation. *J. Food Eng.* **2022**, *312*, 110744. [CrossRef]
64. Moorthy, K.; Kamarudin, A.A.; Xin, L.; Hui, L.M.; Way, L.T.; Fang, P.S.; Carmen, W. Green packaging purchase behaviour: A study on Malaysian consumers. *Environ. Dev. Sustain.* **2021**, *23*, 15391–15412. [CrossRef]
65. Herbes, C.; Beuthner, C.; Ramme, I. How green is your packaging—A comparative international study of cues consumers use to recognize environmentally friendly packaging. *Int. J. Consum. Stud.* **2020**, *44*, 258–271. [CrossRef]
66. Singh, G.; Pandey, N. The determinants of green packaging that influence buyers' willingness to pay a price premium. *Australas. Mark. J.* **2018**, *26*, 221–230. [CrossRef]
67. Petrescu, D.C.; Bran, F.; Radulescu, C.V.; Petrescu-Mag, R.M. Green Procurement through Forest Stewardship Council (FSC) Certification in the Private Sector. Perceptions and Willingness to Buy of Private Companies from Romania. *Amfiteatru Econ.* **2020**, *22*, 42–56. [CrossRef]

68. Lăzăroiu, G.; Neguriţă, O.; Grecu, I.; Grecu, G.; Mitran, P.C. Consumers' decision-making process on social commerce platforms: Online trust, perceived risk, and purchase intentions. *Front. Psychol.* **2020**, *11*, 890. [CrossRef] [PubMed]
69. Ketelsen, M.; Janssen, M.; Hamm, U. Consumers' response to environmentally-friendly food packaging—A systematic review. *J. Clean. Prod.* **2020**, *254*, 120123. [CrossRef]
70. Lăzăroiu, G.; Pera, A.; Ștefănescu-Mihăilă, R.O.; Mircică, N.; Neguriță, O. Can neuroscience assist us in constructing better patterns of economic decision-making? *Front. Behav. Neurosci.* **2017**, *11*, 188. [CrossRef] [PubMed]
71. Siracusa, V.; Rosa, M.D. Sustainable packaging. In *Sustainable Food Systems from Agriculture to Industry: Improving Production and Processing*; Galanakis, C.M., Ed.; Academic Press: Amsterdam, The Netherlands, 2018; pp. 275–307. [CrossRef]
72. Wu, F.; Misra, M.; Mohanty, A.K. Challenges and new opportunities on barrier performance of biodegradable polymers for sustainable packaging. *Prog. Polym. Sci.* **2021**, *117*, 101395. [CrossRef]
73. Kozik, N. Sustainable packaging as a tool for global sustainable development. In Proceedings of the 19th International Scientific Conference Globalization and its Socio-Economic Consequences 2019—Sustainability in the Global-Knowledge Economy, Rajecke Teplice, Slovakia, 9–10 October 2019.
74. Boz, Z.; Korhonen, V.; Koelsch Sand, C. Consumer considerations for the implementation of sustainable packaging: A review. *Sustainability* **2020**, *12*, 2192. [CrossRef]
75. Tiekstra, S.; Dopico-Parada, A.; Koivula, H.; Lahti, J.; Buntinx, M. Holistic approach to a successful market implementation of active and intelligent food packaging. *Foods* **2021**, *10*, 465. [CrossRef]
76. Orzan, G.; Cruceru, A.F.; Bălăceanu, C.T.; Chivu, R.-G. Consumers' behavior concerning sustainable packaging: An exploratory study on Romanian consumers. *Sustainability* **2018**, *10*, 1787. [CrossRef]
77. Kocetkovs, V.; Muizniece-Brasava, S.; Kirse-Ozolina, A. Consumer awareness and attitudes towards active and intelligent packaging systems in the Latvian market. In Proceedings of the 13th Baltic Conference on Food Science and Technology (FoodBalt 2019), Jelgava, Latvia, 2–3 May 2019.
78. Drago, E.; Campardelli, R.; Pettinato, M.; Perego, P. Innovations in smart packaging concepts for food: An extensive review. *Foods* **2020**, *9*, 1628. [CrossRef] [PubMed]
79. Popovic, I.; Bossink, B.A.G.; van der Sijde, P.C.; Fong, C.Y.M. Why are consumers willing to pay more for liquid foods in environmentally friendly packaging? A dual attitudes perspective. *Sustainability* **2020**, *12*, 2812. [CrossRef]
80. Chersan, I.C.; Dumitru, V.F.; Gorgan, C.; Gorgan, V. Green Public Procurement in the Academic Literature. *Amfiteatru Econ.* **2020**, *22*, 82–101. [CrossRef]
81. Kádeková, Z.; Savov, R.; Košičiarová, I.; Valaskova, K. CSR Activities and Their Impact on Brand Value in Food Enterprises in Slovakia Based on Foreign Participation. *Sustainability* **2020**, *12*, 4856. [CrossRef]
82. Cammarelle, A.; Viscecchia, R.; Bimbo, F. Intention to purchase milk packaged in biodegradable packaging: Evidence from Italian consumers. *Foods* **2021**, *10*, 2068. [CrossRef] [PubMed]
83. Sharma, S.P. Recent trends in packaging. In *Edible Food Packaging*; Poonia, A., Dhewa, T., Eds.; Springer: Singapore, 2022; pp. 449–460. [CrossRef]
84. Watson, R.; Cug, J. The impact of the COVID-19 pandemic on consumer satisfaction judgments, behavior patterns, and purchase intentions. *Anal. Metaphys.* **2021**, *20*, 174–186. [CrossRef]
85. Ratnapuri, C.I.; Kurnianingrum, D.; Yustian, O.R.; Alamsyah, D.P. Product packaging in support of consumer loyalty. In Proceedings of the Second Asia Pacific International Conference on Industrial Engineering and Operations Management, Surakarta, Indonesia, 14–16 September 2021.
86. Kotler, P.; Keller, K.L. *Marketing Management, Global Edition*; Pearson Education: London, UK, 2016.
87. Rundh, B. The multi-faceted dimension of packaging: Marketing logistic or marketing tool? *Br. Food J.* **2005**, *107*, 670–684. [CrossRef]
88. Lydekaityte, J.; Tambo, T. Smart packaging: Definitions, models and packaging as an intermediator between digital and physical product management. *Int. Rev. Retail Distrib. Consum. Res.* **2020**, *30*, 377–410. [CrossRef]
89. Ringle, C.M.; Wende, S.; Becker, J.M. *SmartPLS 3*; SmartPLS GmbH: Boenningstedt, Germany, 2015; Available online: https://www.smartpls.com (accessed on 15 September 2022).
90. Hair, J.F.; Black, W.C.; Babin, B.J. *Multivariate Data Analysis: A Global Perspective*; Pearson Education: London, UK, 2010.
91. Henseler, J.; Sarstedt, M. Goodness-of-fit indices for partial least squares path modeling. *Comput. Stat.* **2013**, *28*, 565–580. [CrossRef]
92. Chin, W.W. The partial least squares approach for structural equation modeling. In *Methodology for Business and Management*; Marcoulides, G.A., Ed.; Lawrence Erlbaum Associates Publishers: Mahwah, NJ, USA, 1998; pp. 293–336.
93. Mai, R.; Symmank, C.; Seeberg-Elverfeldt, B. Light and pale colors in food packaging: When does this package cue signal superior healthiness or inferior tastiness? *J. Retail.* **2016**, *92*, 426–4446. [CrossRef]
94. Newman, C.L.; Howlett, E.; Burton, S. Effects of objective and evaluative front-of-package cues on food evaluation and choice: The moderating influence of comparative and noncomparative processing contexts. *J. Consum. Res.* **2016**, *42*, 749–766. [CrossRef]
95. Sundar, A.; Noseworthy, T.J. Too exciting to fail, too sincere to succeed: The effects of brand personality on sensory disconfirmation. *J. Consum. Res.* **2016**, *43*, 44–67. [CrossRef]
96. Binninger, A.-S. Perception of naturalness of food packaging and its role in consumer product evaluation. *J. Food Prod. Mark.* **2015**, *23*, 251–266. [CrossRef]

97. Dabija, D.-C.; Băbuț, R. Enhancing apparel store patronage through retailers' attributes and sustainability. A generational approach. *Sustainability* **2019**, *11*, 4532. [CrossRef]
98. Nemat, B.; Razzaghi, M.; Bolton, K.; Rousta, K. The potential of food packaging attributes to influence consumers' decisions to sort waste. *Sustainability* **2020**, *12*, 2234. [CrossRef]
99. Dabija, D.-C.; Bejan, B.M.; Grant, D.B. The Impact of consumer green behaviour on green loyalty among retail formats: A Romanian case study. *Morav. Geogr. Rep.* **2018**, *26*, 173–185. [CrossRef]
100. Dabija, D.C.; Câmpian, V.; Pop, A.-R.; Băbuț, R. Generating loyalty towards fast fashion stores: A cross-generational approach based on store attributes and socio-environmental responsibility. *Oeconomia Copernic.* **2022**, *13*, 891–934. [CrossRef]
101. Wang, E.S.-T. Different effects of utilitarian and hedonic benefits of retail food packaging on perceived product quality and purchase intention. *J. Food Prod. Mark.* **2017**, *23*, 239–250. [CrossRef]
102. Henseler, J.; Ringle, C.M.; Sarstedt, M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Mark. Sci.* **2014**, *43*, 115–135. [CrossRef]
103. Sarstedt, M.; Ringle, C.M.; Hair, J.F. Partial least squares structural equation modeling. In *Handbook of Market Research*; Homburg, C., Klarmann, M., Vomberg, A., Eds.; Springer: Cham, Switzerland, 2017; pp. 1–40. [CrossRef]
104. Hao, Y.; Liu, H.; Chen, H.; Sha, Y.; Ji, H.; Fan, J. What affect consumers' willingness to pay for green packaging? Evidence from China. *Resour. Conserv. Recycl.* **2019**, *141*, 21–29. [CrossRef]
105. Bhat, S.A.; Rizwan, D.; Mir, S.A.; Wani, S.M.; Masoodi, F.A. Advances in apple packaging: A review. *J. Food Sci. Technol.* **2022**. [CrossRef]
106. Santos, V.; Gomes, S.; Nogueira, M. Sustainable packaging: Does eating organic really make a difference on product-packaging interaction? *J. Clean. Prod.* **2021**, *304*, 127066. [CrossRef]
107. Otto, S.; Strenger, M.; Maier-Nöth, A.; Schmid, M. Food packaging and sustainability—Consumer perception vs. correlated scientific facts: A review. *J. Clean. Prod.* **2021**, *298*, 126733. [CrossRef]
108. Kiss, A.; Pfeiffer, L.; Popp, J.; Oláh, J.; Lakner, Z. A Blind Man Leads a Blind Man? Personalised Nutrition-Related Attitudes, Knowledge and Behaviours of Fitness Trainers in Hungary. *Nutrients* **2020**, *12*, 663. [CrossRef]
109. Salgado, P.R.; Di Giorgio, L.; Musso, Y.S.; Mauri, A.N. Recent developments in smart food packaging focused on biobased and biodegradable polymers. *Front. Sustain. Food Syst.* **2021**, *5*, 630393. [CrossRef]
110. Sani, M.A.; Azizi-Lalabadi, M.; Tavassoli, M.; Mohammadi, K.; McClements, D.J. Recent advances in the development of smart and active biodegradable packaging materials. *Nanomaterials* **2021**, *11*, 1331. [CrossRef] [PubMed]
111. Andronie, M.; Lăzăroiu, G.; Ștefănescu, R.; Ionescu, L.; Cocoșatu, M. Neuromanagement decision-making and cognitive algorithmic processes in the technological adoption of mobile commerce apps. *Oeconomia Copernic.* **2021**, *12*, 863–888. [CrossRef]
112. Omerović, N.; Djisalov, M.; Živojević, K.; Mladenović, M.; Vunduk, J.; Milenković, I.; Knežević, N.Ž.; Gadjanski, I.; Vidić, J. Antimicrobial nanoparticles and biodegradable polymer composites for active food packaging applications. *Compr. Rev. Food Sci. Food Saf.* **2021**, *20*, 2428–2454. [CrossRef]
113. Wei, S.; Ang, T.; Jancenelle, V.E. Willingness to pay more for green products: The interplay of consumer characteristics and customer participation. *J. Retail. Consum. Serv.* **2018**, *45*, 230–238. [CrossRef]
114. Majeed, A.; Ahmed, I.; Rasheed, A. Investigating influencing factors on consumers' choice behavior and their environmental concerns while purchasing green products in Pakistan. *J. Environ. Plan. Manag.* **2022**, *65*, 1110–1134. [CrossRef]
115. Loučanová, E.; Parobek, J.; Nosáľová, M. The perception of intelligent packaging innovation: The latest process and technological progress. In *Food Preservation and Packaging—Recent Process and Technological Advancements*; Tumuluru, J.S., Ed.; IntechOpen: London, UK, 2022. [CrossRef]
116. Yan, M.R.; Hsieh, S.; Ricacho, N. Innovative food packaging, food quality and safety, and consumer perspectives. *Processes* **2022**, *10*, 747. [CrossRef]