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Consumer awareness, preferences and perception of plant-based protein as a sustainable alternatives to conventional meat: Evidence from Raipur District, Chhattisgarh

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Abstract

Rising concern over the environmental and health costs of conventional meat production has renewed interest in plant-based protein as a sustainable dietary alternative, yet evidence on how consumers in India's Tier-II cities perceive and engage with these products remains limited. This study examines consumer awareness and preferences toward plant-based protein as a sustainable dietary choice, and compares consumer perception of these products with conventional meat on health, taste, safety and sustainability, drawing on primary data collected from 120 consumers and 30 food outlets in the Dharsiwa and Abhanpur blocks of Raipur district, Chhattisgarh, during 2025-26 using pre-tested structured interview schedules. Data were analysed using percentage analysis, mean score analysis, and weighted mean/Likert-scale analysis.

Sixty per cent of consumers, and seventy per cent of food outlets, were aware of plant-based protein products such as soy chunks, tofu, plant-based meat and pulses, with social media the most frequently cited source of awareness. Actual consumption lagged behind awareness: 40.0 per cent of consumers had never consumed such products, and traditional sources – pulses (79.2%) and soy chunks (60.0%) – were far more widely consumed than processed alternatives such as tofu (35.0%) and plant-based meat (29.2%). Health was the strongest driver of consumption (weighted mean 3.86), ahead of cost (3.53) and taste (3.40). Perception among the 72 aware consumers was favourable overall: plant-based protein was rated more environmentally sustainable (weighted mean 4.25), safer (3.69) and healthier (3.76) than conventional meat, though taste perception remained comparatively neutral (3.36), with over half of aware respondents undecided on this dimension. Perception among food outlets broadly mirrored consumer perception, with 90.0 per cent agreeing that plant-based protein is healthier than meat.

The results suggest that awareness and favourable perception of plant-based protein in Raipur are running ahead of actual consumption, and that sensory uncertainty around taste – rather than doubts about health, safety or sustainability – is the most likely constraint on wider dietary adoption. Strengthening consumer education and creating opportunities for direct product trial emerge as priority levers for accelerating adoption in this study area.

Keywords: Plant-based protein, consumer awareness, consumer perception, meat alternatives, sustainable diet, Raipur, Chhattisgarh

1. Introduction

The global food system is facing significant environmental, health, and resource challenges due to climate change, biodiversity loss, water scarcity, and the increasing demand for food. These challenges have intensified the need for sustainable dietary systems capable of meeting nutritional requirements while minimizing environmental impacts (FAO, 2006; UNFCCC, 2015) [6, 20]. Livestock production is one of the major contributors to these environmental pressures, requiring substantially greater amounts of land, water, and energy per unit of protein than plant-based food systems, while also accounting for a considerable share of global greenhouse gas emissions (Poore & Nemecek, 2018;

Nijdam *et al.* 2012) [16, 15]. Consequently, reducing dependence on conventional meat has become an important strategy for promoting environmental sustainability and public health (Sabat  & Soret, 2014) [17]. Plant-based protein products, prepared from soy, pea protein, wheat gluten, pulses, and legumes, have emerged as one of the most promising alternatives to conventional meat because of their lower environmental footprint and favourable nutritional profile (Joshi & Kumar, 2015; Choudhury *et al.*, 2020) [11, 5]. Scientific evidence indicates that plant-based diets are associated with reduced risks of obesity, cardiovascular diseases, and other lifestyle-related disorders (Willett *et al.* 2019) [22]. However, the successful adoption of these

products depends not only on their nutritional and environmental benefits but also on consumers' perceptions regarding health, taste, safety, and familiarity (Hartmann & Siegrist, 2017; Bryant & Sanctorem, 2021) ^[8, 4]. Furthermore, a narrative review by Szenderák *et al.* (2022) ^[19] highlighted that although consumers generally recognize the health and environmental benefits of plant-based meat substitutes, concerns related to taste and texture continue to be the primary barriers to their wider acceptance.

India provides a distinctive context for examining consumer awareness and perception of plant-based protein products. The country's long-standing vegetarian food culture, increasing health consciousness, and rapid urbanisation have created favourable conditions for the growth of the plant-based protein industry (Virmani, 2023) ^[21]. Nevertheless, high product prices, limited availability outside metropolitan cities, and uneven consumer awareness continue to restrict their widespread adoption (MarketsandMarkets, 2023) ^[12]. Existing consumer-level research, both internationally and within India, has largely focused on metropolitan or Western urban populations (Hoek *et al.* 2004; Apostolidis & McLeay, 2016; Michel *et al.* 2021) ^[9, 1, 13]. Consequently, relatively little empirical evidence is available from Tier-II cities such as Raipur, where traditional dietary practices coexist with an increasingly modern retail environment.

Chhattisgarh possesses a strong agricultural base with substantial production of pulses, legumes, oilseeds, and millets, providing favourable conditions for the promotion of plant-based protein products (ICAR, 2022) ^[10]. This makes Raipur a potentially important emerging market for sustainable protein alternatives. However, whether consumers in the region are sufficiently aware of these products and perceive them as healthier, safer, tastier, and more environmentally sustainable than conventional meat remains an empirical question. Understanding these perceptions is important because awareness and favourable consumer attitudes are essential preconditions for product adoption. Moreover, identifying whether consumer hesitation is driven by concerns about taste, health, safety, or sustainability can help policymakers, researchers, and food manufacturers design appropriate interventions, including consumer education programmes, marketing strategies, and product reformulation initiatives.

Objectives

1. To explore consumer awareness and preferences toward plant-based protein as a sustainable dietary choice in the study area, and
2. To compare consumer perception of plant-based protein products with conventional meat in terms of health, taste, safety and sustainability. Findings relating to market availability, affordability and accessibility, and to the barriers and prospects shaping adoption, fall outside the scope of the present paper and are reported separately.

2. Research Gap

The demand for plant-based protein products is increasing due to growing health and environmental concerns. However, consumer awareness, perception, and acceptance of these products remain limited in Raipur district of Chhattisgarh. Therefore, this study aims to assess consumer

awareness, compare perceptions of plant-based protein with conventional meat, and evaluate the availability, affordability, and accessibility of these products. The findings will help policymakers, agribusiness firms, and food marketers develop effective strategies to promote plant-based protein consumption and support sustainable food systems.

3. Materials and Methods

3.1 Study Area

The study was conducted in the Dharsiwa and Abhanpur blocks of Raipur district, the administrative and commercial capital of Chhattisgarh state, central India. Dharsiwa was selected for its peri-urban and urban character, where consumers are comparatively more exposed to organised retail and newly introduced food products, while Abhanpur was selected to represent semi-urban consumers of varied socio-economic background. Raipur's expanding base of supermarkets, specialty food stores and food-service outlets, combined with rising health consciousness among its growing middle class, makes it a relevant setting in which to examine awareness and perception of plant-based protein at a stage when the category is still emerging locally.

3.2 Sampling Procedure

A multistage sampling design was used. Raipur district was purposively selected at the first stage for its combination of urbanisation and agricultural hinterland; the Dharsiwa and Abhanpur blocks were purposively selected at the second stage to capture urban/peri-urban and semi-urban consumer segments respectively. At the third stage, 120 consumers were selected by convenience sampling from supermarkets, retail outlets, health-food stores, cafés and other public locations across the two blocks, with an effort made to include respondents across a range of age groups, educational levels, occupations and income categories. In parallel, 30 food outlets-restaurants, cafes, Dhaba's and specialty food stores -were purposively selected to capture the supply side of the market. The combined sample for the parent study was 150 respondents; the analysis reported here draws mainly on the 120-consumer sample, supplemented by food-outlet responses where they bear directly on the two objectives addressed.

3.3 Data Collection Instrument

Primary data were collected during 2025-26 through personal interviews using two separate, pre-tested, structured interview schedules-one for consumers and one for food outlets-prepared in accordance with the study objectives. The consumer schedule recorded demographic characteristics, awareness of plant-based protein products and its sources, consumption frequency and product types consumed, and five-point Likert-scale perception statements comparing plant-based protein with conventional meat on health, taste, safety, sustainability, nutritional adequacy and trust in product quality. Perception statements were administered only to the 72 consumers (60.0% of the sample) who reported prior awareness of plant-based protein products, since perception relative to meat presupposes some familiarity with the category. The food-outlet schedule recorded business profile and awareness alongside a parallel Likert-scale item on perceived health benefits. Both

schedules were pre-tested on a small group of respondents outside the selected sample before finalisation.

3.4 Statistical Tools and Techniques

Data were coded, tabulated and analysed in Microsoft Excel using techniques appropriate to the two objectives addressed in this paper. Percentage analysis was used to summarise the socio-demographic profile of respondents, awareness levels, sources of awareness, consumption patterns and product types:

Percentage (%) = (Number of respondents in category / Total respondents) × 100

Weighted mean analysis was used to rank the reasons underlying consumption of plant-based protein and to score the strength of consumer perception on each comparison dimension:

Weighted Mean Score (WMS) = $\Sigma(WX) / \Sigma W$

where W is the number of respondents choosing a given response category and X is the score assigned to that category.

All perception statements were rated on a standard five-point Likert scale (Strongly Agree = 5, Agree = 4, Neutral =

3, Disagree = 2, Strongly Disagree = 1), consistent with the scale conventions used in comparable consumer-perception studies of alternative proteins [8].

4. Results and Discussion

4.1 Socio-Demographic Profile of Sample Consumers

Table 1 presents the socio-demographic profile of the 120 sample consumers. The sample skewed toward younger adults: respondents aged 21-30 years formed the largest single group (54.2%), followed by those aged 31-40 years (24.2%); only 3.2 per cent were above 50 years old, giving an average respondent age of approximately 30.7 years. Men made up a slightly larger share of the sample than women (54.2% against 45.8%). Graduates were the largest educational group (44.2%), followed by respondents with school-level education (35.8%); postgraduate and professionally qualified respondents together made up a fifth of the sample. Students (36.7%) and salaried employees (27.5%) accounted for almost two-thirds of respondents, and 44.2 per cent of the sample reported a monthly household income below ₹10,000, with a further 39.2 per cent in the ₹10,000-25,000 range. Respondents were drawn in broadly similar proportions from urban (35.0%), semi-urban (34.2%) and rural (30.8%) areas of residence.

Table 1: Socio-Demographic Profile of Sample Consumers (n = 120)

Category	No. of Consumers	Percentage (%)
Age Group (years)		
Below 20	8	6.7
21–30	65	54.2
31–40	29	24.2
41–50	14	11.7
Above 50	4	3.2
Gender		
Male	65	54.2
Female	55	45.8
Educational Qualification		
School	43	35.8
Graduate	53	44.2
Postgraduate	18	15.0
Professional	6	5.0
Occupation		
Student	44	36.7
Salaried	33	27.5
Business	12	10.0
Farmer	14	11.7
Other	17	14.1
Monthly Income		
Below ₹10,000	53	44.2
₹10,000–25,000	47	39.2
₹25,000–50,000	13	10.8
Above ₹50,000	7	5.8
Area of Residence		
Urban	42	35.0
Semi-urban	41	34.2
Rural	37	30.8
Total	120	100.0

Source: Primary Data (2025-26)

This profile is relevant to how the results that follow should be read. A sample weighted toward younger, more educated, urban and semi-urban consumers is, on the evidence of comparable studies elsewhere, precisely the demographic

most likely to be aware of and receptive toward plant-based protein [9, 18], so the awareness and perception levels reported below are best read as indicative of an early-adopter segment rather than of Raipur district's consumer

base as a whole. The supply side of the market, represented by the 30 food outlets surveyed, was drawn predominantly from mid-range and premium restaurants, cafe's and Dhaba's across urban and semi-urban Raipur, serving both vegetarian and mixed menus – the segment of the food-service sector most likely to experiment with new menu categories.

4.2 Consumer Awareness and Preferences toward Plant-Based Protein

Awareness levels. Sixty per cent of the 120 sample consumers (n = 72) reported awareness of plant-based protein products such as soy chunks, tofu, pulses and plant-based meat, against 40.0 per cent who were unaware (Table 2). Awareness was somewhat higher on the supply side of the market: 70.0 per cent of the 30 food outlets surveyed reported awareness of the category, ten percentage points above the consumer figure, suggesting that awareness has diffused a little further among market intermediaries than among the end consumers they serve.

Table 2: Awareness of Plant-Based Protein Products among Consumers and Food Outlets

Respondent Group	n	Aware (%)	n	Not Aware (%)	Total (n)
Consumers	72	60.0	48	40.0	120
Food Outlets	21	70.0	9	30.0	30

Source: Primary Data (2025-26)

Source of awareness. Among the channels through which consumers had learned of plant-based protein, social media was the most frequently cited source, named by 56.7 per cent of respondents, ahead of friends and family (47.1%) and television or other advertisements (30.3%); health professionals were the least-cited source (13.4%) (Table 3). Because respondents could name more than one channel, the underlying pattern is one in which awareness is built primarily through informal, peer- and platform-driven channels rather than clinical or advertising ones – consistent with the more general observation that digital and social platforms increasingly mediate food-related information-seeking among younger, more connected consumers^[13].

Table 3: Sources of Awareness of Plant-Based Protein Products among Consumers (Multiple Response, n = 120)

Source of Awareness	No. of Consumers	Percentage to Total (%)
Social Media	68	56.7
Friends/Family	56	47.1
TV/Advertisements	36	30.3
Others	27	22.7
Health Professionals	16	13.4

Source: Primary Data (2025-26). Percentages are based on multiple responses and do not sum to 100.

Consumption pattern. Awareness, however, had only partly translated into consumption. Of the full consumer sample, 20.8 per cent consumed plant-based protein products regularly and 33.3 per cent occasionally, but 40.0 per cent had never consumed such products at all, and a further 5.8 per cent did so only rarely (Table 4). This gap between stated awareness (60.0%) and non-consumption (40.0% of the full sample) indicates that a meaningful share of aware consumers have yet to act on that awareness, a pattern also

reported among European consumers, among whom familiarity with sustainable protein alternatives has been found to run consistently ahead of actual trial^[8].

Table 4: Consumption Pattern of Plant-Based Protein Products among Consumers (n = 120)

Consumption Frequency	No. of Consumers	Percentage to Total (%)
Regularly	25	20.8
Occasionally	40	33.3
Rarely	7	5.8
Never	48	40.0
Total	120	100.0

Source: Primary Data (2025-26)

Product preferences. Among the 72 consumers who had ever consumed plant-based protein, preference favoured familiar, traditionally available sources over newer processed alternatives (Table 5). Pulses were consumed by 79.2 per cent and soy chunks by 60.0 per cent of this group, while protein powder (48.3%), tofu (35.0%) and plant-based meat (29.2%) – the categories closest to direct meat substitutes – were consumed by markedly fewer respondents. This ordering suggests that what is emerging in Raipur is, for the most part, continuity with an existing pulse- and legume-based diet rather than adoption of the processed meat-analogue products that dominate global market commentary^[14], a distinction with direct implications for how the category's growth should be read locally.

Table 5: Types of Plant-Based Protein Products Consumed (Multiple Response, n = 72)

Product Type	No. of Consumers	Percentage to Total (%)
Pulses	95	79.2
Soy Chunks	72	60.0
Protein Powder	58	48.3
Tofu	42	35.0
Plant-Based Meat	35	29.2

Source: Primary Data (2025-26). Percentages are based on multiple responses and do not sum to 100; total responses = 302.

Reasons for consumption. Weighted mean analysis of the reasons underlying consumption (Table 6) ranked health benefits first (weighted mean 3.86), ahead of cost (3.53), taste (3.40), environmental concern (3.18) and religious considerations (2.69). The clear primacy of health over environmental motivation is consistent with evidence elsewhere that health consciousness, rather than ethical or ecological concern, is typically the stronger predictor of meat-substitution behaviour among consumers who are not already ideologically committed to sustainability^[2, 1].

Table 6: Weighted Mean Analysis of Reasons for Consuming Plant-Based Protein Products (n = 72)

Reason	Weighted Score	Weighted Mean	Rank
Health	278	3.86	I
Cost	254	3.53	II
Taste	245	3.40	III
Environmental Concern	229	3.18	IV
Religious Reasons	194	2.69	V

Source: Primary Data (2025-26). Scale: Strongly Agree = 5 to Strongly Disagree = 1.

Frequency of meat consumption. Frequency of meat consumption among the full consumer sample provides a further reference point (Table 7): 45.0 per cent ate meat only occasionally and 26.7 per cent never did so, while a combined 28.3 per cent consumed it weekly or daily. Read alongside the consumption figures above, this suggests a sample in which outright meat avoidance is already fairly common, plausibly reflecting Chhattisgarh's broader vegetarian food culture, and in which the more relevant question for plant-based protein's growth is less whether consumers eat meat at all than whether occasional meat-eaters can be drawn toward plant-based protein on the specific dimensions examined next.

Table 7: Frequency of Meat Consumption among Consumers (n = 120)

Meat Consumption Frequency	No. of Consumers	Percentage to Total (%)
Daily	1	0.8
Weekly	33	27.5
Occasionally	54	45.0
Never	32	26.7
Total	120	100.0

Source: Primary Data (2025-26)

4.3 Consumer Perception of Plant-Based Protein Relative to Conventional Meat

Perception statements were addressed to the 72 consumers with prior awareness of plant-based protein products, each rated on a five-point Likert scale from Strongly Disagree (1) to Strongly Agree (5) and summarised using weighted mean scores. Table 8 ranks the six comparison dimensions assessed -the four specified in the second objective (health, taste, safety and sustainability) together with two supporting dimensions, nutritional adequacy and trust in product quality.

Table 8: Consumer Perception of Plant-Based Protein Products Relative to Conventional Meat – Summary of Weighted Mean Scores (n = 72)

Perception Dimension	Weighted Score	Weighted Mean	Rank
Environmental Sustainability	306	4.25	I
Health	271	3.76	II
Safety	266	3.69	III
Trust in Product Quality	257	3.57	IV
Nutritional Adequacy	251	3.49	V
Taste	242	3.36	VI

Source: Primary Data (2025-26). Scale: Strongly Agree = 5 to Strongly Disagree = 1.

Health. Perception of health benefits was strongly positive: 44.4 per cent of aware consumers agreed and 25.0 per cent strongly agreed that plant-based protein is healthier than conventional meat, against only 13.9 per cent who disagreed or strongly disagreed (Table 9), yielding a weighted mean of 3.76. Food outlets held an even more favourable view on the equivalent statement – 63.3 per cent agreed and 26.7 per cent strongly agreed, with no outlet disagreeing (Table 10) – suggesting that health positioning is already well internalised on the supply side of the Raipur market, running somewhat ahead of full consumer conviction. This pattern is consistent with the EAT-Lancet synthesis linking

plant-based diets to reduced risk of diet-related disease [22], and with evidence that health framing, more than any other attribute, drives positive perception of plant-based meat substitutes [5].

Table 9: Consumer Perception that Plant-Based Protein is Healthier than Conventional Meat (n = 72)

Response	No. of Consumers	Percentage (%)	Weighted Score
Strongly Agree	18	25.0	90
Agree	32	44.4	128
Neutral	12	16.7	36
Disagree	7	9.7	14
Strongly Disagree	3	4.2	3
Total	72	100.0	271

Source: Primary Data (2025-26). Weighted Mean = 3.76.

Table 10: Food Outlet Perception that Plant-Based Protein is Healthier than Conventional Meat (n = 30)

Response	No. of Outlets	Percentage to Total (%)
Strongly Agree	8	26.7
Agree	19	63.3
Neutral	3	10.0
Disagree	0	0.0
Strongly Disagree	0	0.0
Total	30	100.0

Source: Primary Data (2025-26)

Taste. Taste was the one dimension on which consumer perception was not clearly favourable. The statement that plant-based protein tastes as good as meat received a weighted mean of only 3.36, the lowest of the six dimensions assessed, and more than half of aware respondents (52.8%) were neutral rather than in agreement or disagreement (Table 11); only 38.9 per cent agreed or strongly agreed, while 8.3 per cent disagreed and none strongly disagreed. The near-absence of strong disagreement, combined with the size of the neutral group, points less to active taste rejection than to limited direct experience with the products – a pattern the consumer-research literature on plant-based meat substitutes identifies as the central, and most tractable, barrier to mainstream adoption: taste concern in the aggregate evidence tends to reflect unfamiliarity as much as demonstrated sensory dislike, and typically narrows with repeated exposure and trial [8, 19, 13].

Table 11: Consumer Perception that Plant-Based Protein Tastes as Good as Conventional Meat (n = 72)

Response	No. of Consumers	Percentage (%)	Weighted Score
Strongly Agree	4	5.6	20
Agree	24	33.3	96
Neutral	38	52.8	114
Disagree	6	8.3	12
Strongly Disagree	0	0.0	0
Total	72	100.0	242

Source: Primary Data (2025-26). Weighted Mean = 3.36.

Safety. Perceived safety followed the health pattern: 55.6 per cent of aware consumers agreed and 8.3 per cent strongly agreed that plant-based protein carries lower disease risk than conventional meat, against only 2.8 per

cent disagreement, for a weighted mean of 3.69 (Table 12). The low incidence of concern on this dimension suggests that food-safety scepticism, a documented barrier to alternative-protein adoption in some Western markets ^[19], is not a significant constraint among aware consumers in this study area.

Table 12: Consumer Perception that Plant-Based Protein is Safer than Conventional Meat (n = 72)

Response	No. of Consumers	Percentage (%)	Weighted Score
Strongly Agree	6	8.3	30
Agree	40	55.6	160
Neutral	24	33.3	72
Disagree	2	2.8	4
Strongly Disagree	0	0.0	0
Total	72	100.0	266

Source: Primary Data (2025-26). Weighted Mean = 3.69.

Environmental sustainability. Environmental sustainability drew the strongest agreement of any dimension assessed: 48.6 per cent agreed and 38.9 per cent strongly agreed that plant-based protein is more environmentally sustainable than conventional meat, against 1.4 per cent disagreement, for a weighted mean of 4.25 (Table 13). This finding is well aligned with the environmental-impact literature underpinning the case for plant-based diets ^[16, 17], and indicates that, among Raipur consumers already aware of the category, the sustainability argument for plant-based protein is essentially won; the more open question, on this evidence, is taste rather than environmental conviction.

Table 13: Consumer Perception that Plant-Based Protein is Environmentally Sustainable (n = 72)

Response	No. of Consumers	Percentage (%)	Weighted Score
Strongly Agree	28	38.9	140
Agree	35	48.6	140
Neutral	8	11.1	24
Disagree	1	1.4	2
Strongly Disagree	0	0.0	0
Total	72	100.0	306

Source: Primary Data (2025-26). Weighted Mean = 4.25.

Nutritional adequacy and trust. Two further dimensions round out the perception picture (Table 14). Nutritional adequacy – whether plant-based protein is nutritionally comparable to meat – drew a more measured response (weighted mean 3.49), with 41.7 per cent neutral and only 6.9 per cent strongly agreeing, suggesting some residual uncertainty about whether plant-based sources fully substitute for meat's nutritional profile, a concern also documented in relation to protein quality and micronutrient content in commercial plant-based products ^[5]. Trust in product quality was somewhat more positive (weighted mean 3.57), with 50.0 per cent agreement and only 4.2 per cent disagreement, though a substantial neutral group (40.3%) again points to a category consumers view favourably in principle but have not yet fully evaluated in practice.

Table 14: Consumer Perception regarding Nutritional Adequacy and Trust in Quality of Plant-Based Protein Products (n = 72)

Response	No. of Consumers	Percentage (%)	Weighted Score
Nutritional Adequacy (Weighted Mean = 3.49)			
Strongly Agree	5	6.9	25
Agree	31	43.1	124
Neutral	30	41.7	90
Disagree	6	8.3	12
Strongly Disagree	0	0.0	0
Trust in Product Quality (Weighted Mean = 3.57)			
Strongly Agree	4	5.6	20
Agree	36	50.0	144
Neutral	29	40.3	87
Disagree	3	4.2	6
Strongly Disagree	0	0.0	0

Source: Primary Data (2025-26)

4.4 Awareness, Preference and Perception Considered Together

Considered jointly, the findings for the two objectives addressed in this paper describe a market at an early, favourably disposed stage of development rather than one held back by consumer scepticism. Awareness is moderate rather than universal (60.0% of consumers, 70.0% of food outlets), and consumption trails awareness by a wide margin, but this is not because consumers who do become aware form a negative view of the category: on four of the six perception dimensions measured – sustainability, health, safety and trust – weighted mean scores exceeded 3.5 on a five-point scale, and disagreement was consistently low, generally under 15 per cent of aware respondents. The one dimension on which conviction was not yet formed, taste, and to a lesser extent nutritional adequacy, is also the dimension for which the response pattern – high neutrality rather than high disagreement – most resembles inexperience rather than rejection. Preference data reinforce this reading: aware consumers who do consume plant-based protein overwhelmingly reach for pulses and soy chunks, foods that require no adjustment to conventional taste expectations, rather than processed meat-analogue products, where the sensory comparison with meat is most direct and most exposed to doubt.

Read together with the demographic profile in Section 3.1, these results are broadly consistent with patterns reported in other markets, where awareness and favourable perception of plant-based protein concentrate among younger, more educated, urban consumers, and translate into actual dietary substitution only gradually, mediated by direct product experience rather than by argument alone ^[9, 18].

5. Summary

This paper examined two objectives drawn from a broader study of the plant-based protein market in Raipur district, Chhattisgarh. On consumer awareness and preferences, 60.0 per cent of the 120 sample consumers, and 70.0 per cent of the 30 food outlets surveyed, reported awareness of plant-based protein products, built primarily through social media and informal networks. Consumption trailed awareness, with 40.0 per cent of consumers having never consumed

such products, and where consumption did occur it favoured familiar pulses and soy foods (79.2% and 60.0% of consumers respectively) over processed meat analogues such as tofu (35.0%) and plant-based meat (29.2%). Health was the leading motivator for consumption (weighted mean 3.86), ahead of cost and taste.

On consumer perception relative to conventional meat, aware consumers rated plant-based protein most favourably on environmental sustainability (weighted mean 4.25), followed by health (3.76), safety (3.69), trust in quality (3.57) and nutritional adequacy (3.49); taste alone remained comparatively neutral (3.36), with the largest share of respondents undecided on this dimension. Food outlets echoed the favourable consumer view of health benefits, with 90.0 per cent in agreement. Taken together, the findings point to a market in which awareness and favourable perception are running ahead of actual dietary substitution, and in which limited direct product experience – most visible in unresolved taste perception – appears to be the binding constraint on adoption, rather than doubts about health, safety or environmental credentials.

6. Limitations

The findings reported here are subject to certain limitations common to single-district, cross-sectional consumer surveys. Consumers were selected by convenience sampling rather than a full probability design, and the resulting sample skews toward younger, urban and semi-urban respondents; the results are therefore best read as indicative of an early-adopter segment rather than as representative of Raipur district's consumer population as a whole. Perception data are based on the 72 consumers who reported prior awareness of plant-based protein products and cannot speak to how the remaining 40.0 per cent might perceive the category once exposed to it. Food-outlet perception was assessed on a single statement (health) rather than the full set of dimensions covered for consumers, limiting direct comparison on taste, safety and sustainability. Finally, plant-based protein remains a relatively unfamiliar concept in this market, and self-reported perception may be less stable, and more sensitive to recent media exposure, than it would be in a more mature market.

7. Conclusion and Recommendations

This study set out to examine consumer awareness and preferences toward plant-based protein as a sustainable dietary choice in Raipur district, and to compare consumer perception of these products with conventional meat on health, taste, safety and sustainability. Sixty per cent of sample consumers, and seventy per cent of surveyed food outlets, reported awareness of the category, built primarily through social media and informal networks; yet 40.0 per cent of consumers had never consumed a plant-based protein product, and where consumption did occur it favoured familiar pulses and soy foods over processed meat analogues. Perception among aware consumers was favourable on sustainability, health, safety and trust, but markedly more neutral on taste, the one dimension where the products invite direct sensory comparison with meat. Taken together, these findings indicate that the principal constraint on plant-based protein adoption in this study area is not scepticism about its health, safety or environmental

credentials, on which the case already appears largely accepted, but limited direct product experience, most visible in unresolved taste perception and moderate consumption. This points to two priorities for stakeholders seeking to grow the category locally: continuing to build awareness through the social and peer channels that already dominate information diffusion in this market, and creating low-risk opportunities for direct product trial – through food outlets, sampling initiatives, or recipe integration with familiar dishes – so that neutral taste perception can be resolved through experience rather than left to persist as an open question. Addressing the market-availability and adoption-barrier dimensions of this question, examined separately in the broader thesis from which this paper is drawn, would complement these findings and merits attention in future extension and outreach efforts in the study area.

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