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Lab Meat - A Study of the Emerging Trend, Awareness and Acceptance for a Sustainable Practice

Dr. Gauri D. Shah [1] Dr. Prachi Wani [2]

[1] Associate Professor, AISSMS College of Hotel Management and Catering Technology, Savitribai Phule Pune University, Pune. E-Mail ID- gauristars@gmail.com

ORCID No. 0000-0002-3824-9720

[2] Sr. Assistant Professor, Balaji Institute of Management and Human Resource Development (BIMHRD), Sri Balaji University Pune. E-Mail ID - phajare@gmail.com

ORCID No. 0000-0003-1274-9660

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Abstract

Lab-grown meat foods are part of the rising field of cell farming and agriculture. It is still a beginning phasefield; it looks to convey items customarily made through domesticated animals raised in controlled structures that require no or fundamentally decreased human association. Key models incorporate refined meat, milk, egg white and boneless chicken. Shellfish etc.

Feeding everyone in a way that doesn't harm the planet is a big challenge for the future. Meat is a really important part of many people's diets, and the demand for it keeps growing. But natural meat farming has some big effects on the environment, like the emission of more greenhouse gases, and extensive use of land and water. So, one of the major problems we face is finding ways to Produce and eat meat, milk, and other proteins that don't hurt the environment so much. (Meat and Dairy Production - Our World in Data). The primary reason for this paper is to throw light on the research on some socio and environmental factors of Lab meat or refined meat. Specifically, this paper highlights the interest, preference and acknowledgement of the concept of Lab-grown or refined meat. It likewise talks about a few early outcomes on the ecological effects ofrefined meat, stressing the commitments.

Keywords– Animal farming, Lab Meat, Cultured Meat, Clean Meat, In Vitro meat, Meat Industrv. Food Science

1. Introduction

Meat intake worldwide has risen in both developed and developing countries. During the 20th century, meat consumption increased by five times globally, and meat utilization expanded from 45 million tons in 1950 to 300 million tons. (FAO,2020) These demands are currently fulfilled by Meat from Farms which are specially bred for human consumption.

This is a big industry, which is already dealing with a lot of environmental, and social issues (Weidema et al., 2015) hence it becomes difficult to protect Animal, Human and environmental rights in the increasing demand for meatconsumption as the non-vegetarian crowd is increasing in its percentage in the total population of the world. It is challenging to fulfil the increasing demands of the meat industry without the help of artificial meat. The industry must find a way out of animal welfare, healthiness, and sustainability issues and challenge the struggle to develop regular meat and protein products in an increasingly multifaceted regulatory environment (Lynch et al., 2014). These innovative meat and protein products, also known as 'artificial meat,' utilize groundbreaking technologies to meet the traditional meat (Alexander et al., 2021)

Lab-grown meat concept and facts - A comprehensive type of terms that portray the technique of creating meat from animal cells. The terms commonly used by associations in the space are "created" and "refined." Other decisions range from the more sensible, for instance, "cell refined," "lab-created," and "in vitro," to exhibiting terms like "clean" and "butcher-free."

The Scientists are deciding on the best word to transform the concept appealing the most to purchasers and businesses by regulators. (McKinsey report 2021) Many evolving industries are scurrying into this ever-expanding market of lab-grown meats, and ready-to-produce food that centres on even a few favourite foods. Lab meats include beef, poultry, pork, and seafood 1. In vitro or cultured Meat is cultivated in cell culture instead of an animal's body. Significant advantages of lab-grown meat include sustainability, animal welfare, environmental friendliness, sustainable foods, and food safety.

Plant-based meat is not similar to lab-based meat. Instead, it replicates the flavour and texture of actual sausage, beef, and other meats with animal products. They accomplish this by using unique recipes and food preparation techniques. Such as genetically developed yeast to supply heme, juiciness, and colour of realmeat by artificially injected hormones. Through years of research, several scientists have created lab-grown meats (Bryant & Szejda, 2019).

Cultured meat and meat from genetically modified tissues have no natural capacity to compete with conventional meat. Meat substitutes from plant proteins and mycoprotein are currently the most significantcompetitors and are acquiring a reasonable market share (Singh et al., 2020)

Lab meats may put traditional hearts into the premium end category if typical meat products become expensive. The palatability and versatility of lab meats are versatile. Meat processing vendors can adapt agro-ecology concepts to develop sustainable animal production practices. The meat industry can also incorporate biotechnologies such as converting genetic Modifications (Bryant & Szejda, 2019). Although it depends on the evolutionof meat production, the future of artificial meat produced from stem cells appears uncertain; cultured meat is created by in vitro cell culture or Lab-grown Meat, as commonly known, rather than from butchered animals. It is a type of cell farming.

Cultured meat is delivered utilizing vast numbers of similar tissue-building systems. In 1998, Jon Vein acquired a patent for manufacturing lab-grown meat for human consumption. Jason Matheny promoted thesame idea of cultured meat in the mid-2000s by drafting a research paper on refined meat creation. In 2013,Mark Post, a teacher at Maastricht University, was the first to exhibit a proof-of-idea for cultured meat by making the main burger patty legitimately the media picked up consideration from the same point mentioned above. However, due to restricted research exercises, Lab Meat was not so popularized until. Singapore launched its first restaurant selling lab-grown Chicken Nuggets on the menu.

In the preference or choices among the meats, chicken or poultry is the most preferred lab-grown meat for producers and consumers. but beef is also the second most preferred meat for consumption, primarily in sausage and minced form. In addition, Mosa Meat has just built the main plant to create cultured meat. The Dutch company, Mosa Meat, launched its first hamburger in London in 2013. The burger contained fiveounces of mature beef, which was cooked and analyzed by a panel of London-based sensory experts, whofound it tasted close to a regular burger. For this burger, the financial cost was more than 330,000 dollars. The event encouraged consumers, notably those interested in animal welfare, to support the commercialintroduction of these meat products. The company, Mosa Meat was established by Dr Mark Post, who estimates that cultured meat may enter the market by the end of 2021.

Cultured meat isn't yet monetarily accessible, and it presently can't seem to be acknowledged by buyers as meat. The creation procedure, despite everything, has many opportunities to get better. Its applications lead it to have a few imminent well-being, ecological, social, and financial observations in contrast to traditional meat.

The organization 'Super Meats' has been working in Israel with the Hebrew University of Jerusalem for a long time. News reports on 19th Dec 2021, demonstrate that three of Israel's cultured meat organizations -

known as Super Meats Food, Future Meat Innovation and Future Meat - will profit the $300 million from theconcept and selling items.

Different terms like Butcher-free Meat known as artificial Meat, In-vitro Meat, Vat-developed, lab-developedMeat, Cell-based Meat, Clean Meat, Cultivated Meat, Manufactured Meat, and Synthetic Meat mean the same as Lab meat. Between 2016 and 2019, clean meat picked up the footing as the term flavoured by certain writers, backers, and associations that helped the innovation. The Good Food Institute (GFI) authored the word in 2016 and, in late 2018, distributed research that guaranteed "spotless" better-symbolized creation and advantages of the meat and beat "refined" and "in vitro" terms. The media gives more weight to clean meat terms.

Despite this, some industry partners felt that the term was pointlessly separate from traditional meat makers, inclined toward cell-based meat as a nonpartisan option. In September 2019, GFI reported new research which found that the word developed meat is adequately engaging and separating, has a high level of impartiality, and positions exceptionally for buyers. Meat is an essential yet expensive source of protein. Artificial meat offers a safe and disease-free way to meet increasing meat requirements without involving animal sacrifice and at the same time reducing greenhouse emissions compared to conventional meat. Artificial meat is also known as Cultured Meat. It is produced by the same tissue engineering

Techniques used in cultivated meat are as below,

- Cell lines are purchased or developed for never-ending use.
- Cells grow in nutrient-rich media in seed-trained bioreactors.
- Cells reach the desired density in the main bioreactors.
- Cells are harvested in a centrifugation process.
- Harvested cells are prepared for distribution.

Due to limited dedicated research activities, Artificial Meat is not yet commercialized. Lab-grown meat also lessens the negative environmental impact of contemporary intensive meat production. It has a higher protein content compared to slaughtered animal meat. The seed genes forlab-grown meat production are taken from live animal biopsies or animal embryos. Meat demand is multiplying. In 2050, the worldwide population will exceed nine billion. The meat demand isprojected to be 70 per cent at quite this level, consistent with figures from the United Nations Food and Agriculture Organization.

The switch from traditional meat to lab-grown meat might have a beneficial effect on human health.lab-grown meat is produced by growing cells, which does not cause any damage to the animal. The lab-grown heart can end the suffering of billions of livestock each year. Lab-grown meat production is themore extraordinary environmentally friendly kind that does not require chemicals and is carried out in a closed

system, avoiding runoff from entering the natural environment. Indian researchers have begun working on producing plant-based meat. India started creating minced cultured chicken meat products customized for the Indian market. Currently, cell-based chicken kheema Biryani, a prevalent Indian dish, isbeing developed; it might become available in India by 2025.

2. Literature Review

Lab-grown meat, a potential solution for animal welfare, sustainability, and food security, is gaining traction. While awareness of this technology is rising globally, widespread adoption depends on consumer acceptance among meat eaters. Spagnolini et al (2023) reveal a complex interplay of factors influencing this. Ethical concerns about animal treatment and environmental impact motivate some to try lab-grown meat. However, safety, perceived naturalness, and potential health risks remain concerns for others. Taste, texture, and overall sensory experience are also crucial for acceptance. Affordability is a key barrier, with consumers expecting lab-grown meat to be competitively priced. Studies suggest that positive messaging highlighting environmental and ethical benefits can improve consumer attitudes. Open communication addressing safety and the naturalness of production is crucial. Additionally, exposing consumers to the sensory experience of lab-grown meat can positively influence perception. Research gaps remain in understanding long-term consumer behaviour, the role of culture in acceptance across diverse populations, and the need for targeted communication strategies. As awareness grows, addressing concerns and emphasizing the benefits will be key to increasing consumer acceptance of lab-grown meat among meat eaters.

The McKinsey report (2021) highlighted a few crucial points. Lab meat has the potential to replicate the taste, texture, smell, nutritional composition, and appearance of conventional meat. For cultured meat to become a large industry, many things must happen, not the least of which is that tens of billions of dollars must be spent to get it to even 1% of the world's protein market. The next decade's focus will be on demonstrating commercial feasibility with moderate market penetration. To succeed, the sector must allay fears about a unique cuisine while also delivering reasonably priced pleasure. The future of the expansion will depend on 5 key factors: acceptance by customers. Risks, Position in terms of cost; Reaction to policyand Supply.

A. Escribano et al... (2021) studied five attributes in the study related to lab meat production, sustainability, carbon footprint, origin, and price. The study has shed some light on 03 types of cultured, plant-based, and conventional meat products. Consumers give much importance to the origin of the heart when they are buying the heart. This would be impossible when purchasing meat alternatives like lab-grown or replaced with vegetal components. While responding to the questions, a maximum number ofrespondents preferred to have heart-grown conventionally rather than consuming laboratory-made beef. These customers are also not willing to pay premium prices for cultured beef.

Christopher B. and Barnett J (2021) reviewed in their paper that vegetarians and vegans have a more positive approach toward the cultured meat concept. Young male customers have more inclination toward lab meat.[2] The research also states that many consumers assume cultured meat will have a mediocre taste, texture, or appearance compared to conventional beef. One of the research projects reviewed in the paper mentioned that 23.6% of their respondents thought that cultured meat would be delicious; 39% thought it would not be, and 37.5% did not know the taste. Having said this, we must also remember that cultured meat will impact the farming done by traditional farmers where animal farming plays a significant role.

Tejas Suthar, and Anupama Devkatte (2020) stated that Global meat output is currently at 263 million tons, and by 2050, it is predicted to nearly quadruple to 445 million tons. In this area, India has also seized the lead.12 The Institute of Chemical Technology (ICT) in Mumbai has partnered with the Good Food Institute,a global non-profit organization dedicated to research and commercialization in the plant and cell-based meat sector, to open a lab facility in Mumbai by 2020. Even the Food Safety and Standards Authority of India (FSSAI) has taken encouraging steps toward developing standards for clean meat products. However, the product is not yet ready for assessment; therefore, regulators have begun negotiations with allstakeholders.

George S (2020) has excellently explained how lab-grown meat is processed with numerous advantages. The paper also highlights current market conditions and how companies worldwide are venturing into lab meat. Progress from conventional meat to a lab-developed core (Clean Meat) may benefit human well-being. Domesticated animal items are the human eating regimen's principal wellspring of absorbed fat related to medical conditions like coronary illness and strokes. Lab-developed meat can be important down-to-earth food because of the profile of essential amino acids and fats, just as bioactive mixtures guarantee to conceal specific health needs for people with different diseases.

Mengistie D (2020) has mentioned a few advantages of cultured meat. One of the reasons is to control meat composition and quality by changing the design of the culture medium or co-culturing with other cell types like flavour, fat percentage, and presence of saturated to unsaturated fatty acids. The healthy changeis substituting unfavorable saturated fats with healthy fats, like omega-3. Conventional meat production practices have risks like disease, a shortage of natural food in the environment, and an unfortunate greenhouse effect on meat. In cultured meat, conditions are controlled to an extent and manipulatedto reduce the risk.

Sergei (2019) states that lab-grown meat is an exciting option for animal remains and the problems caused by its production methods and meeting future global demands for protein availability. So,a few start-up companies in the US and other countries are hoping that lab-grown meat may be available onretail shelves

by or before 2021. Most importantly, it's essential to have a legislative, and regulatory framework ready. The readiness of users to consume lab-grown meat is relevant to a great degree to the feasibility benefits concerning conventionally produced meat. Information about specific benefits will help increase consumers' confidence and acceptance. One more challenge to the socioeconomic status of this new technology, as has happened many times, is the separation of the livestock industry, where millions of people are directly or indirectly involved.

M. Mancini (2018) concluded in his research that respondents were aware of cultured meat in Italy. Halfof the respondents were willing to try the lab meat from a maximum number of male participants. were chosen. Age plays a vital role in trying new food items, which proved right in this research as respondents below 25 were the most significant chunk of people who would push the cultured meat. Out ofvarious statements in the research, regarding the respondents' point of view about lab meat, the mean of Cultured Meat will contribute to preserving natural resources was found to be the highest, followed by Cultured beef.

Bercovici Jeff (2017) emphasized that meat without an association with an animal is not new. Winston Churchill wrote in 1932 that eventually, the meat would be grown in different parts in a suitable atmosphere.The science of growing lab meat has been in existence for the last 20 years, and it's just that this was not inthe limelight. Uma Valeti, the vegetarian co-founder of the lab-meat startup Memphis Meats, is doing a lot of research on lab meat. This interesting startup has an investment from venture capitalist Steve Jurvetson and other well-known names like Bill Gates, Richard Branson, and Jack Welch, helping this startup grow. Mr. Valeti's meat without animal vision came after finishing his cardiology fellowship at the Mayo Clinic in 2005. In a cutting-edge clinical trial, he used stem cells to repair damage caused by cardiac arrest. Stem Cells are indivisible cells that become different types of tissue as they mature; injected into a heart that's been destroyed by cardiovascular disease. They can form healthy new muscles to replace what has beenlost. The company is doing well in introducing lab meat to the outside world. Memphis Meats held itsfirst-ever tasting for outsiders, inviting more than 25 people to sample fried chicken and duck à l'orange.

Slade (2017) stated that there is enough research on reducing daily meat intake. Consumers have positive and negative opinions about lab meat, and the argument is based on various sources of positive and negative information. The taste of meat plays a prominent role in adopting lab meat. The research highlights that consumers look at the taste, texture, appearance, and smell of lab meat, which they find close to plant-based meat substitutes. Consumers do not prefer lamb meat for long as they tend to go back and forth while selecting the meat type

Zuhaib Fayaz Bhat et al. (2015) state a set of problems related to lab meat. One of the problems with thein vitro meat production system is that it can keep us away from nature and animals, which is similar to living in a city away from nature. Cultured meat adapts to the growing reliance on technology; hence it is going away from nature more than ever before. Large-scale production and market penetration are usually associated with dramatic price declines, although the high cost of cultured meat is the main potential obstacle. The colour and appearance of meat outside the body may have some difficulties competing with traditional meat.

3. Research Methodology

3.1 Research Design-The scope and approach paper supports the thinking of an interdisciplinary sector of the Science, Environment and Food Industry. It draws heavily upon published literature and professional experience as well as on surveys conducted across the 7 countries with a specific age group and a non-vegetarian groupof people. This includes ongoing laboratory work to produce cultured meat and surveys with consumers and food experts in the selected area. This Research principally utilizes auxiliary information. Data that was utilized for exploration was solely based on optional sources from various distributions. The suitable wellsprings of information gathered are distributed and unpublished sources like books, magazines, diaries, reports, publications, the site of variousinternet-based diaries, and so on. Most publications inspected for this study have been gathered using Online Newspapers, Articles, and Blog information base. The main terms used to investigate suitable articles contained "meat" in the title as well as "Lab-grown meat" in each text.

3.2 Objectives

- To know the General awareness of lab-grown Meat among the population.
- To understand potential customers' preferences and acceptance of Lab-grown Meat.
- To study various reasons for preferring or not preferring lab-grown meat

4. Data Analysis and Interpretation

4.1 Socio-Demographic Profile of Respondents

Age	%	N	Gender	%	N		Country of Residence	%	n
20 – 40	53.2	153	Male	64.2	140		India	65.1	142
41 – 59	33	72	Female	35.8	78		USA	14.2	31
>60	13.8	30					Australia	5.5	12
Total	100	218	Total	100	218		UK	5.0	11
							UAE	3.2	7
							Germany	1.4	3
							Canada	5.5	12
							Total	100.0	218

Current meat Production puts significant expenses on the climate. As a result, a small group of customers will settle on meat substitutes or vegetarian options. Cultured meat might add to address this dilemma. In this Survey, the researcher explored the preferences based on demographic separation and summed up customer feedback concerning processed meat. Nonetheless, an examination from 6 other nationalities other than India was accessible. We set quotas for age and Gender for all seven countries to ensure that the samples were representative of the generalpopulation concerning these variables.

Therefore, we directed a review of those members along these lines of Gender, Age, and Nationality to be significant in writing. With a panel test of 218 respondents,perspectives were structured in three aspects: awareness of the concept in particular Nationality, age group, and Gender against the acceptance in the same comparison. The most grounded positive driver depends on pre-information accessible for 53.2% of members in the age group of 20 to 40 and the probability of the same group representing different nationalities for the feedback. The third aspect communicates the worldwide Environmental benefits and, on the contrary, the toll on ecology due tocultured meat.

To sum up the outcomes, Overall, the Male Gender, 64.2% of the selected population and people from India and the USA, respectively, 65.1% and 14.2 % of the chosen population show decently ready to acknowledge cultivated meat.

We aimed to enlist representative samples of more than 15 people in each country, a minimum of 5% of the selected population, to understand the acceptance and awareness of the same concept In India against the other Developed countries. This shows that if cultured meat is included in the retail market, then the Environmental cause can be achieved by eliminating the secretion of Mithen gas due to cattle farming which is more hazardous than CO2 also it will reduce the carbon footprints in the environment due to supply chain management of animal farming to the storehouse.

Since internet access is limited among age groups above 60 in India, these samples were skewed toward higher income and more urban groups; hence 13% of respondents were primarily selectedfrom Tier 1 cities representing above 50 and below 60 age groups of both genders only from India.
However, this is likely to be representative of the population who will hesitate to clean meatacceptance. Participants under 18 were not considered to participate in any shortlisted country in terms of age and Gender.

4.2 Willingness to engage with Lab-grown meat

Awareness of the concept Lab-grown meat			Willing to spreadawareness of Lab-grown meat			Willingness to buy or consumelab-grown meat		
	%	n		%	N		%	N
Yes	76.1	166	Yes	75.2	164	Yes always	14.7	32
No	23.9	52	No	24.8	54	Once forcuriosity	47.7	104
Total	100.0	218				Never as I amagainst the concept	37.6	82
						Total	100.0	218

Meat production through livestock farming will become a significant problem shortly. Cultured meat offers a solution to all those problems. Cultured meat requires 90% less land, less water, and 60% less energy than meat from livestock through more efficient raw materials. Cultured meat is the only. alternative to regular meat that consists of real meat. It has the taste, odour, tenderness, juiciness, and mouthfeel of traditional meat. Meat specialists select the best and tastiest ingredients to make your favourite meat.

Acknowledgement for acquiring data on awareness regarding cultured meat is collected through Yes and No questions. When detailed data is given, and after tasting in a rehashed measures plan, the replies are tabulated as 76% of the selected population shows awareness related to the concept. In connection to the same 75.2%, the population sample is willing to contribute to creating more awareness about the same topic. Certainly, against incline toward,' 'purchase' questions summated into a general 'Acknowledgment' variable, of willingness to consume constantly, desire to consume once only for curiosity and not to finish. Tangible insight factors included appearance, smell, shading, taste, delicacy,and succulence on a corrupt scale.

The willingness to consume only for curiosity is 47.7%, and not willingness to finish at all is 37.6%. These both willingness variables sound opposite, but on the parameterof spreading the lab-grown meat popularity and making it a retail product, their results have the same impact on purchase preference. Previous assessments have proposed that the overall population is partitioned over their eagerness to think about consuming cultured meat (Lab Meat). As business support for new cultured meat-producing companies increases and public interest in the US, Europe,and other nations extends, officially assessing perspectives on these items will become progressivelymeaningful. The ability to pay may explain the point of acceptability of Lab Meat items, showing hidden cultural meat consumption inclinations. Until now, no analyses have assessed the willingness to pay for Lab Meat items.

4.3 Preferred Way to consume Lab-grown meat

Parameters	%	N
Frozen cold meat products (Sausages, Ham, Bacon)	51	112
Ready cook Foods (Cutlets, Nuggets, Patties, Etc.)	23	51
Steaks	9	19
Processed, Frozen and ready-to-eat food (Fabricated, marinated cuts)	17	36

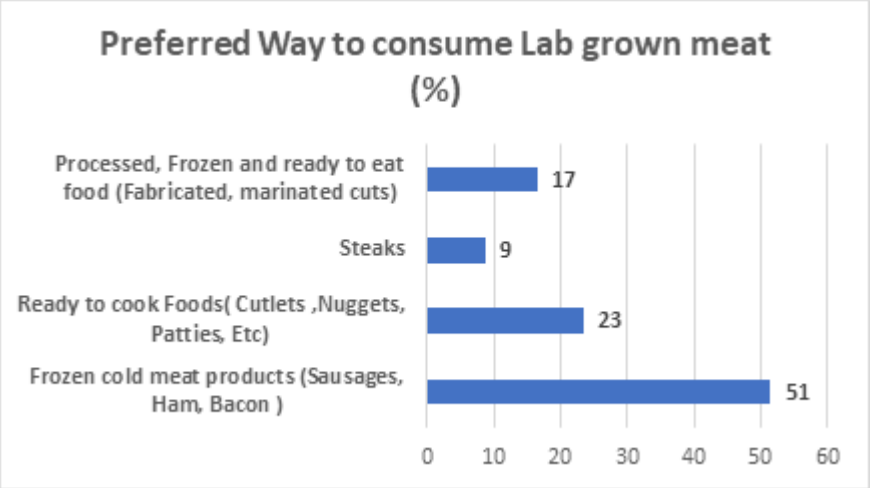

Chart – 4.3.1.1

The data was analyzed for taste variations among consumers and the form identified for consumption of Lab-grown meat in the study include Frozen cold meat products (Sausages, Ham, Bacon) Ready to cook Foods (Cutlets, Nuggets, Patties) Steaks, Processed, Frozen and ready to eat food (Fabricated, marinated cuts). A high consumer acceptance was recorded for frozen cold meat products (Sausages,Ham, Bacon) with 51% preference. Moreover, a comparatively weaker preference was displayed for steaks (9%). Processed, Frozen and ready-to-eat food (Fabricated, marinated cuts) and ready-to-cook Foods(Cutlets, Nuggets, and Patties) (23%) collectively make up 40% of our sample. The data thus indicates that frozen cold meat constitutes the highest range in terms of preference for lab-grown meat products.

4.4. Preferred way of meat consumption

Type of Meat	Preferred as regular Farmed %	Preferred as Lab Meat %
Chicken and Poultry	56	70
Lamb and Mutton	20	10
Beef	13	17
Pork	2	0
Seafood and fish	9	3
Total		

The above figure shows the genuine preferences of various types of meats between the farm-raised and Lab-grown varieties. The different meat choices across both streams are evaluated on the pie chart. At the point when no data is given, the portion of the overall industry of farm-raised Chicken is 56%, while the lab-grown chicken preference is 76% which is the highest preferred meat amongst allvarieties. These meat choices have decisive consumption of Lamb and mutton around 20% for

Farm-raised and only 10%for Lab-grown respectively and individually. Lab-developed Pork meat hasthe lowest demand of 0% against 2% for farm-raised.

The bunch of customers picking farm-raised Beefis 13% but these consumers would prefer lab-grown beef more as those account for 17%.

Demonstrating ecological information expands the portion of lab-developed meat and Farm-raised meat for seafood is very minimal but comparatively higher than acceptance of Pork 9% for farm-raised. seafood and 3% for lab-grown seafood separately, while the portion of this shows that giving data significantly affects the choices of the sectors preferring sources of the different meat options. Furthermore, in the Technology treatment, where individuals need to be educated lab-grown meat utilization benefits in many more ways. Curiously, it is higher in chicken but not in red meats

5. Findings and Results

- To know the General awareness of lab-grown Meat amongst the population. Male Gender, 64.2% of the selected population and people from India and the USA, respectively, 65.1% and 14.2 % of the chosen population show decently ready to acknowledge cultivated meat.
- Lab-grown meat includes delivering meat from creature cells, not from butchered creatures.This advancement can reform the meat business, with wide ramifications for the climate, well-being and creature government assistance
- To understand potential customers' preferences and acceptance of Lab-grown Meat. Curiously,it is higher in chicken but not in red meats. Preference for farm-raised Chicken is 56%, while the lab-grown chicken preference is 76% which is the highest preferred meat among all varieties
- Among the various reasons for preferring or not preferring lab-grown meat, the most prominent ones are Genetic modification and medical complications due to which Lab meat consumptionhas less acceptance currently
- Over 67% were open to the idea of tasting or buying cultured meat on account of perusingthe above-given data. An expected ability to follow through on 4.2% more than the cost of a traditional type of meat.
- 33% of respondents expressed they were 'most certainly or likely' not ready to accept cultured meat. Interestingly, 29.3% of hoteliers were 'certainly or presumably' reluctant to eat refined meat and not sure about their consumers' acceptance of Lab-grown Meat
- critical requirement of different techniques used in Protein development needs to be as per the government norms of any particular country. This approach helps to regularize the selling and consumption of Lab-grown meat which results in better acceptance by customers for the

consumption

- Lab-grown meat can promptly reshape the world as far as we might be concerned. It can resolvea few ecological issues, for example, air, soil and water contamination presented by conventional farming. It can likewise definitely lessen the dangers of arising irresistible infections, which are essentially connected with the capacity, creation and utilization of creaturefood.
- More specifically, farm-raised Chicken is the most preferred in the Asian sector followed by Beef in Europe, America and Canada. On the other hand, the coefficient Lab, referring to lab-grown meat, is statistically Growing in Acceptance but needs an awareness drive undertaken from the Environment, animal welfare, and Food security angle by all manufacturingindustries emerging in the business with extensive marking.
- A second significant area of study has been the assessments of different publics about refinedmeat. Of the time those in the field diminish this to the issue of 'shopper acknowledgement', although we ask the requirement for a more extensive outlining of this issuepast probably buying choices to likewise incorporate more extensive individual and political convictions, vulnerabilities, and uncertainties about the cultural effect of refined meat Most concentrate on a report a variety of reactions crossing positive and negative, albeit the Finnish review found outstandingly lower levels of help for refined meat, while the Dutch review recommended the more members found out about refined meat the more, they were able to helpit. Concentrating on the effect of new information on insight was the critical concentration

6. Conclusions:

Lab-grown meat is gaining popularity with consumers as well as the food industry and is commonly known as ‘meat without slaughter. It has been considered an alternative to conventional meat from animals and is predicted to significantly reduce the environmental impact on agriculture and eventual sustainability. Due to the steady awareness of veganism and ethical considerations, the general awareness of Lab-grown meat has shown a steady rise. The nutritional effects of lab-grown meat are still not realized nor is it completely backed up by science due to which a certain amount of reluctance to consume it in varied forms is noticed. Chicken, in the form of lab meat, has a higher preference than red meat. Genetic modifications and medical complications, once addressed to the population, seem toincrease the preference and consumption margin of Lab-grown meat drastically.

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Conflict of Interest

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