Nutrition Label Usage: An Empirical Study of Consumer Response in India

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Abstract

Purpose : Indian consumers are in the process of changing their consumption/buying behaviour, especially with respect to food items. The present study attempts to explore the Indian consumers' level of awareness and usage of information given on food product labels. The research also aims to understand the association of demographic differences with regard to food label usage. Moreover, it intends to identify the specific nutritive and non-nutritive information, and food attributes that consumers seek from food labels.

Design/Methodology/Approach : The data was collected using a structured questionnaire-based survey. A total of 250 respondents were considered for the study. Friedman's ANOVA, Descriptive statistics, and Chi-square test were used to analyze the data.

Findings : The results indicated that Indian consumers, like consumers in other countries, are reading nutrition labels and that these labels influence their purchase decisions. The research also indicated that quality and nutrition are the primary attributes which consumers seek from food products. Fat, energy, and the amount of cholesterol in food products were found to be the most frequently sought nutritional information, while environment related information was rarely pursued. Income level, education, and gender play a role in the usage of nutritional labels by the consumers. Consumers seek further simplification and standardization of food labels

Originality/Value : The outcomes of the study will help Indian policy makers and food companies to understand the complexity of issues involved in nutrient labelling, and design strategies to maximize benefits from resources spent on food labelling.

Keywords: **nutrition, processed food, food labels**

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The food processing industry is one of the largest industries in India; it is ranked fifth in terms of production, consumption, export and anticipated growth potential (Agricultural and Processed Food Products Export Development Authority, 2013). Fortified with a population of 1.08 billion, and growing rapidly at a rate of about 1.6 % per year, India is a promising market for processed food products. Its 350 million strong urban middle class, with its fast evolving food habits signals favorable prospects for agricultural products and processed foods (APEDA, 2013). According to the Ministry of Food Processing Industries (2013), the processed food market, accounts for 32% or US$ 29.4 billion of the total estimated US$ 91.66 billion food market. India, one of the dominant emerging economies, is witnessing unprecedented growth in the consumption of processed and packaged food.

However, of late, dietary intake in India is showing a trend towards higher fat and carbohydrate content (Popkin, Horton, Kim, Mahal, & Shuigao, 2001), which is a cause for concern. A nutrition education project undertaken by WHO demonstrated that education regarding lifestyle changes can improve the health of entire communities (Reimer, 2009). Similarly, healthcare professionals believe that awareness and use of food labels can help consumers adopt a balanced diet (Shine, O'Reilly, & O'Sullivan, 1997). One approach that can be employed to motivate consumers to decrease the consumption of negative nutrients is to improve the food product composition, which is a daunting task and not practically enforceable; an alternative approach could be to prompt consumers to make healthier dietary choices. To do so, consumers must be able to differentiate healthier foodstuffs from less

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healthy ones; this can be achieved by reducing the opacity in the nutritional composition of processed foods and by introducing clarity about food constituents (Feunekesa, Gortemakera, Willemsa, Liona, & Kommerb, 2006). Food label is an implement that reduces information asymmetry and search costs, thereby, helping consumers make their preferred selections (Mackison, Anderson, & Wrieden, 2010). The prospect of assisting consumers in making healthy nutritional choices has activated the food industry, government, and health related organizations to put food labeling on their policy agenda (Mackison, Anderson, & Wrieden, 2008).

The processed food industry also confronts the challenge of conforming to international standards of procurement, processing, packaging and labeling (APEDA, 2013). Since August 2011, India has been proud of having a consolidated and strengthened law, the Food Safety and Standards Act, 2006, to regulate food products; this act is unequivocal in ensuring that consumers throughout the country should have access to safe and quality food, and in controlling the risk of food adulteration. Moreover, according to the Food Safety and Standards Authority of India (FSSAI, 2013), this acts protects consumers by putting the onus of compliance on companies and transferring to them the obligation of following the law. The Food Safety and Standards (Packaging and Labeling) Regulations, 2011 have made it mandatory for pre-packaged food to carry a label comprising information as obligated by the act. According to Chapter 2, Para 2.2 of Food Safety and Standards Authority of India Notification, dated August 1, 2011, a label must have printed on it the following information (not exhaustive): a list of ingredients; nutritional information, for example, energy value in kcal, the amounts of proteins, carbohydrates, types of fats or cholesterol, and so forth; a statement regarding vegetarian or non-vegetarian food; statement about food additives; best before and use by date; net quantity; country of origin; instructions for use; to name a few of the obligatory requirements. There is a distinct influence of these policies on consumer choice, food advertising, and international trade (Gruère & Rao, 2007).

In view of the above discussed concerns, a study of the consumer understanding and usage of food labels was mandated. Moreover, food labeling regulations have recently been enforced in India; even though numerous studies have been conducted in the western nations, there is not much literature available regarding this subject in the Indian context. Also, the terms nutrition label and food label have been used interchangeably in this study.

Theoretical Framework

Ling, Choo, and Pysarchik (2004), in a study on food adoption by Indians, asserted that Indians have traditionally placed a lot of value on the importance of fresh and healthy food; cultural influences reinforced by a modern approach to healthy nourishment have reinforced this intent. Processed foods are a new concept to the Indian population, while the time constrained urban Indians are adopting this concept with alacrity, they continue to seek the nutritional benefits of fresh food. However, the food corporates have been very efficacious in substituting fresh and healthy food from consumers' food regime with fast food and processed food. The promotion strategies of these companies are largely focused on children, adolescents, and small families in urban areas (Anand, 2011). Campos, Doxey, and Hammond, (2010) were of the view that many consumers use nutrition labels to make their selection of food products. Food label use affects buying behavior because it affects valuations and perceptions about the product. When a product label showcases high nutrient content, consumers assume that the product is healthier and are quite likely to purchase it. Composition of the product significantly influences its purchase probabilities (Baltas, 2001).

➲ **Information Sources and Food Attributes :** Singla (2010) and Gialitakis and Chryssochoidis (2006) were of the view that consumers refer to food labels primarily to compare brands and not to access nutritional information, at times, they refer to food labels even to know about promotional offers and free gifts. Consumers gain access to nutritional information through various sources. Television has been identified as the principal source of information, followed by sources such as friends, the Internet, magazines (Gialitakis & Chryssochoidis, 2006), and doctors or dietitians (Shine et al., 1997). In an empirical study using actual purchase data, Baltas (2001) revealed that there exists a clear trade-off between the nutrition and taste attributes of food products. Adults may attach less importance to taste, whereas children place specific emphasis on it. A study by Stanley and Tschirhart

(1991) cited in Baltas (2001) emphasized that convenience is also an important factor for specific consumer groups such as children or busy adults.

➔ **Objective 1:** To identify the type of information (including non-nutritional) that consumers seek from nutritional labels.

➔ **Objective 2:** To study the product attributes which take precedence while selecting processed food products.

➲ **Specific Nutritional Information Sought from Food Labels :** Campos et al. (2010) carried out a methodical review and found that consumers pay more attention towards nutrients they want to avoid, for example, fat. Other nutrient information commonly sought out by consumers includes energy content, protein, cholesterol, carbohydrates, vitamins and minerals, types of fat, serving size, additives, and sodium content (Mannell, Brevard, Nayga Jr., Combri, Lee, & Gloeckner, 2006).

➔ **Objective 3:** To identify the specific nutrients that consumers seek from food labels.

➲ **Demographics and Label Use :** Individuals vary regarding their willingness to pay attention to food labels in general (Gialitakis & Chryssochoidis, 2006). Consumers who are more aware of nutrition and health are more likely to use nutritional labels. Campos et al., (2010) in their study concluded that middle-aged or young adults were more likely to use nutrition labels as compared to older people. Studies also indicate that women are more likely to use nutrition labels. Drichoutis, Lazaridis, and Nayga Jr. (2006) affirmed that people with a lower level of education and earning are less likely to use labels, moreover, smaller families, families with young children, and urban residents are more likely to search for nutrition information. Healthier eating habits, specific disease diagnosis within the family, and weight control are all related to increased label use. Baltas (2001) observed that the importance of a nutrition attribute varies over people even within the same target market. Consumers on a special diet, organic product users, and those aware of the relation between diet and disease are more likely to search for nutrition information than others. Mackison et al. (2008) also mentioned a study by Levy et al., (1992) which stated that nutritional labels usage is influenced by a host of factors, including the format.

➔ **Objective 4 :** To assess the impact of demographic characteristics of consumers on use of nutrient labels.

Research Methodology

➲ **Methodology :** For the purpose of descriptive research, data on purchase behavior and the attention consumers

Table 1. Demographic Characteristics of the Respondents

Gender	Percent	Family Income (INR)	Percent
Male	39	<20,000	14.7
Female	61	20,001-40,000	13.5
Age (years)		40,001-60,000	25.9
20-30 years	66.1	60,001-80,000	25.5
31-40 years	15.5	>80,001	20.3
>41 years	18.3		
Occupation		**Education**	
Student	60.6	Graduate	36.7
Govt. Employee/ Professional	29.9	Post-Graduate	42.6
Others	9.6	Others	20.7

pay to different categories of information displayed on nutrient labels, was collected through a well-structured questionnaire. Survey research was conducted in four locations, the tri-city of Chandigarh, Mohali, Panchkula, and Delhi NCR in India from April to July 2013. A non-probabilistic sampling approach was used with participants purposively recruited to include respondents from all spheres of life, age groups, and education levels. A total of 256 respondents completed the questionnaires, out of which 250 were found complete and usable. The sample represents a higher than average income group and education group. The details of the demographic profile can be seen in the Table 1. The majority of the respondents (61%) were female. Respondents varied in age ranging from 20 years to over 55 years. The majority of the respondents were between 20 and 40 years old.

Measures

➲ **Awareness and Interest in Nutrition Labels :** Review of relevant literature was undertaken to develop the scales assessing the respondents' interest in diet, their personal evaluation of their health, the frequency of reading labels, and presence of special dietary needs within the household. Furthermore, a list of items that people view on labels was added to assess the type of information consumers seek. In another set, the frequency with which people access specific nutrients was evaluated (Daud, Ramli, Jemahadi, & Razalli, 2011; Shine et al., 1997). The scale used for measuring evaluation of health ranged from *"poor"* to *"excellent"* similarly, the scale used for measuring frequency of reading labels ranged from *"never"* to *"always"*.

➲ **Importance of Product Attributes :** To identify in what way customers perceive nutrition as an important attribute of food products, respondents were asked to rank six attributes in order of importance to them. The attributes were: Convenience, brand, price, taste, quality, and nutrition (Shine et al., 1997).

➲ **Scale Exploring Food Label Usage and Awareness :** Statements to measure food label usage and awareness were adapted from the study of Shine et al. (1997) and US Food and Drug Administration website "How to Understand and Use the Nutrition Facts Labels". The responses were taken on a four point scale ranging from *"never use"* to *"always use"*.

Analysis and Results

➲ **Health - Diet Evaluation and Food Label Usage During Purchase :** Almost 50% of the respondents said that they rated their health as "good" and 29% said that they rated it as "fair," 7% of the respondents reported that their health was in a "poor" condition, and only 12% reported that their health was in "excellent" condition. Surprisingly, similar statistics were noted about how respondents judge the nutritive value of their diet. An analysis of label reading frequency revealed that 40% of the women read food labels every time they purchased food products, and only about 30% of the men said that they did so. Forty percent of the men stated that they do most of the food shopping for the household, which was an unexpected finding. This result is similar to the reports from the retail industry, which suggested that the self-service format is encouraging males to do more of grocery shopping (Mukherjee & Malviya, 2013). Fifty-eight percent of the respondents said that they read the nutrition label the first time a food product is purchased, but rarely read them on subsequent purchases. Twenty six percent said that food labels always affect their food purchase and 56% of the respondents said that this happens sometimes. Fort-four percent respondents said that there are special dietary needs in the household, of these, 41% said that they always read food labels, while 47% said that they did so sometimes.

A noteworthy association between higher level of education and label use was observed, which corroborates with the findings of earlier studies, however, as the sample did not have many respondents with lower levels of education, this aspect needs to be researched further. Label usage was observed to be almost equal across all levels of earnings, but dropped in the level of earnings between INR 60,000 to 80,000, and the usage was observed to be almost equal in both the genders.

Table 2. Ranking of Product Attributes

Product Attributes	Mean Rank	Rank
Brand	3.78	VI
Convenience	3.77	V
Nutrition	3.30	II
Price	3.40	III
Quality	3.08	I
Taste	3.47	IV

Table 3. Type of Information Consumers Seek from Food Labels

S.No.	Attribute	*Always* (%)	*Sometimes* (%)	*Rarely* (%)	*Never* (%)
1.	Nutrition Information	55	16	22	4
2.	Additives/Artificial Colors	35	15	37	12
3.	List of Ingredients	51	17	23	7
4.	Date mark	79	3	11	6
5.	Price	70	10	15	4
6.	Brand	62	11	20	5
7.	Origin	29	14	38	18
8.	Quantity or Weight	40	21	28	10
9	Cooking Instructions	29	21	36	14
10.	Environmental Information	27	10	38	24

➲ **Importance of Product Attributes :** To determine the significance consumers attach to different product attributes and in order to identify how consumers perceive nutrition as an attribute of food products, respondents were asked to rank attributes in terms of importance to them. Quality was found to be the most important attribute, chosen by 38% of the respondents. Nutrition was deemed most important by 35% of the sample. Taste and price were of importance to 34.2% and 34% of the sample respectively, with convenience and brand being of less importance to the majority of those surveyed. Friedman's two-way analysis of variance (ANOVA) was conducted to assess differences among the ranks given by the respondents to the six attributes. The test results indicate a significant difference in the importance of the six attributes, as perceived by the consumers ($\chi^2 = 26.7, p < 0.000$).

Table 4. Association Between Type of Information Consumers Seek from Food Labels and Demographic Variables

Attributes	Age			Gender			Qualification			Annual Income			Occupation		
	χ^2	*df*	sig.	χ^2	*df*	sig.	χ^2	*df*	sig.	χ^2	*df*	sig.	χ^2	*df*	sig.
Date mark	20.02	12	.067	1.12	3	.772	18.78	12	.094	16.18	15	**.370**	30.08	18	.037*
Price	27.90	12	.006*	2.30	3	.512	27.12	12	**.007***	59.08	15	.000*	43.22	18	.001*
Brand	29.56	12	.003*	5.87	3	.118	39.27	12	.000*	20.36	15	.158	29.72	18	.040*
Nutrition Information	32.16	12	**.001***	10.87	3	.012*	16.65	12	**.163**	26.99	15	.029*	36.06	18	.007*
List of Ingredients	35.17	12	.000*	5.47	3	.140	19.82	12	**.071**	31.88	15	.007*	39.96	18	.002*
Quantity or Weight	35.89	12	.000*	2.94	3	.400	50.73	12	.000*	24.70	15	**.054**	37.86	18	.004*
Additives/Artificial Colors	19.10	12	.086	1.45	3	.692	19.38	12	.080	47.71	15	**.000***	44.24	18	.001*
Origin	20.84	12	.053	2.38	3	.497	28.44	12	.005*	44.46	15	.000*	36.51	18	.006*
Cooking Instructions	65.62	12	.000*	2.25	3	.154	42.28	12	**.000***	44.23	15	.000*	80.32	18	.000*
Environmental Information	28.79	12	.004*	3.40	3	.333	19.06	12	.087	23.15	15	.081	48.97	18	.000*

*Significant at 0.05 level

The Table 2 displays the mean ranks of attributes of food products (the higher is the assigned rank, the higher is the importance placed on the attribute).

➲ **Information Consumers Seek from Food Labels :** Respondents were asked to indicate the information they seek from food labels. The findings are presented in the Table 3. Seventy- nine percent of the respondents reported that they always checked the date mark on the label. This was followed by price, with 70% of the respondents reporting that they always checked the price. Information regarding the brand was sought by 62% of the respondents. More than half (55 %) of the respondents were aware of nutrition labeling on food products. Unfortunately, environment related information was found to be rarely pursued by the consumers.

The statistical tool chi-square was used to study the association between the type of information consumers seek from food labels and their demographic variables. From the Table 4, it is evident that a significant relationship can be seen between price on the packaged food products (χ^2 (12) = 27.90, $p < .05$) and age of the respondents. Also, seeking of information regarding the brand of the company (χ^2 (12) = 29.56, $p < .05$) , constituent ingredients (χ^2 (12) = 35.17, $p < .05$), quantity or weight (χ^2 (12) = 35.89, $p < .05$), cooking instructions (χ^2 (12) = 65.62, $p < .05$), environmental information (χ^2 (12) = 28.79, $p < .05$), and the understanding of nutritional information (χ^2 (12)= 32.16, $p < .05$) seem to be related to the age of the respondents. A chi-square test was also performed to determine if males and females were distributed differently across the type of information they seek from food labels. The test indicated that significant differences (χ^2 (3) =10.87, $p < .05$) do exist. The Table 4 also indicates that a significant relationship can be seen between price on the packaged food products, (χ^2 (12) = 27.12, $p < .05$) and qualification of the respondents. Also, brand (χ^2 (12) = 39.27, $p < .05$) , quantity or weight (χ^2 (12) = 50.77, $p < .05$), country of origin (χ^2(12) =28.44, $p < .05$) , and cooking instructions (χ^2 (12) = 42.28, $p < .05$) seem to be related to

Table 5. Specific Nutrients Consumers Seek From Nutrition Labels (percent)

S.No.	Ingredients	*Always*	*Sometimes*	*Rarely*	*Never*
1.	Fat	57	15	22	5
2.	Calories	56	16	24	4
3.	Cholesterol	48	13	28	10
4.	Protein	44	18	31	5
5.	Vitamins	44	21	31	4
6	Iron	36	20	36	7
7.	Carbohydrates	36	18	36	10
8.	Fiber	33	17	40	9

Table 6. Association Between Ingredients Consumers Seek From Nutrition Labels and Demographic Variables

S. No.	Ingredients	Age			Gender			Qualification			Annual Income			Occupation		
		χ^2	*Df*	sig.	χ^2	*df*	sig.	χ^2	*df*	sig.	χ^2	*df*	sig.	χ^2	*df*	sig.
1.	Fat	39.88	12	.000*	8.78	3	.032*	32.50	12	.015*	25.24	15	.047*	30.02	18	.037*
2.	Calories	28.91	12	.004*	2.23	3	.525	21.61	12	.042*	27.52	15	.025*	42.22	18	.001*
3.	Cholesterol	24.70	12	.016*	6.58	3	.087	20.07	12	.006*	29.18	15	.015*	46.13	18	.000*
4.	Protein	28.45	12	.005*	4.52	3	.211	22.67	12	.031*	41.43	15	.000*	45.52	18	.000*
5.	Vitamins	40.64	12	.000*	2.07	3	.557	21.04	12	.050*	30.04	15	.012*	51.04	18	.000*
6.	Iron	49.07	12	.000*	4.30	3	.230	30.76	12	.002*	40.23	15	.000*	67.99	18	.000*
7.	Carbohydrates	52.21	12	.000*	3.04	3	.012*	33.76	12	.001*	33.46	15	.004*	59.19	18	.000*
8.	Fiber	37.30	12	.000*	6.26	3	.100	31.72	12	.002*	31.05	15	.009*	44.46	18	.000*

* Significant at 0.05 level

qualification of the respondents. Moreover, a significant relationship is found between price of the packaged food products (χ^2 (15) = 59.08, $p < .05$) and annual income of the respondents. In addition, nutritional information mentioned on the packaged food items (χ^2 (15) = 26.99, $p < .05$) , list of the ingredients (χ^2 (15) = 31.88, $p < .05$), presence of additive/artificial colors (χ^2 (15) = 47.71, $p < .05$), country of origin (χ^2 (15) =44.46, $p < .05$), cooking instructions (χ^2 (15) = 44.23, $p < .05$) appear to be related to the annual income of the consumers and occupation of the respondents .

➲ **Information Regarding Specific Food Nutrients Sought by the Consumers :** The results of the study indicate that fat and calories were the most commonly looked at items by the majority of the respondents. More than 50% of the respondents looked for the information related to fat and energy. The amount of cholesterol in the food product was the next most frequently sought information by nearly 48% of the respondents. Information regarding proteins and vitamins was considered important by an equal proportion (44%) of consumers. However, the respondents did not look out much for the iron (36%), carbohydrates (36%), and fiber (33%) content in the food product they were planning to purchase.

The statistical tool chi-square was used to study the relationship between specific nutrients and demographic variables. From the Table 6, it can be seen that a significant relationship exists between different ingredients and the age of the respondents. The test also indicates that males and females were distributed differently across the ingredients fat (χ^2 (3) = 8.78, $p < .05$) and carbohydrates (χ^2 (3) = 3.04, $p < .05$). The Table 6 also indicates that a significant relationship can be seen between different ingredients and qualification of the respondents. Also, a significant relationship is found between different ingredients and annual income of the respondents. The study also found that there exists a significant relationship between different ingredients and occupation of the respondents.

Discussion

The findings of this study provide a useful insight into the nutrition label usage by consumers. The study results indicate that Indian consumers, like consumers in other countries, are reading nutrition labels and that these labels influence their purchasing decisions. Since nutrition labelling was made mandatory in India in 2011, a fairly recent happening, only 26% of the respondents said that their food purchases are always influenced by labels, whereas 58% stated that their food purchases are sometimes influenced by labels. Calorie consciousness was equally distributed across gender, but was more emphasized by the 50 plus age group. Similarly, people of ages above 40 years and professionally qualified consumers sought information about cholesterol. Almost 50% of the consumers under 30 years of age looked for information about the protein content of food products, this too was equally distributed across males and females.

Information on vitamins and iron content was almost equally sought across categories of age and education. The research gives valuable insight into the consumers' usage behaviour of food labels. This is a favorable trend as the legislation mandating food labels is a fairly recent one. It was observed that the respondents believed that they were able to interpret the information on a food label, but this area needs further exploration. Another interesting learning which emerged is that people, who have a favorable view of their health, also have a favorable view of their diet. The research also indicated that quality and nutrition are the primary attributes which consumers seek from food products. According to Drichoutis et al. (2006), "more information is always better" may not be the ideal strategy for nutrition labeling. Even though attitudes to nutrition are positive, it is evident from studies that consumers are more concerned about nutrients they wish to avoid rather than attaining a balanced diet. Daud et al. (2011) pointed out that increasing awareness regarding nutrition among consumers has encouraged them to reassess their diet and lifestyles, and this emphasis has prompted consumers towards the acquirement of nutritional information (Shine et al., 1997). These scholars also suggested that special dietary needs within the family influences consumers' interest in food labels.

Managerial Implications, Limitations of the Study, and Scope for Further Research

Consumers seek further simplification and standardization of food labels. The knowledge that they use food labels during buying can be used effectively as a branding strategy to induce purchase. However, the food processing industry must be aware that the consumers are no longer naïve or gullible, and tactics like writing "No fat" on juice labels, will not succeed for long. The concept of labeling may as well be extended to cafeterias, canteens, and restaurants, as these are places where consumers do a large portion of their food consumption. In a small scale survey of teenagers done in 1998, Neale and Langnäse (1998) showed that the provision of simple nutritional labeling information on school meals, in cafeterias, and so forth could have a positive influence on children's choices of school food and be a valuable educational resource to help in the long-term aim of reducing fat intake in the whole population. In fact, food label legislation in US and Europe encourages labeling on foods in school canteens and cafeterias. This should serve as a positive precedent to both policy makers and industry professionals in India. Nutrition labelling is generally only applied to pre-packaged foods, so the consumer is provided with little nutritional information about foods purchased either unpackaged or pre-prepared, for example, by catering outlets (Cowburn & Stockley, 2004).

Effective educational and marketing programmes are important so that consumers are taught how to use labels skillfully. For nutrition labels to have the greatest impact, they must be in a format that is easily understood and used by consumers. A noteworthy association between higher level of education, earnings, and label use was observed in the present study, which corroborates with the findings of earlier studies, however, as the sample did not have many respondents with lower levels of education, this aspect needs to be researched further. Additionally, as the study sample is non-probabilistic and represents a higher than average income group and education group, the results must be generalized judiciously. Most of the respondents were of an age group ranging from 20-40 years, therefore, this study does not capture the views of the younger and older consumers.

With increasing attention being paid to food labels, there are numerous areas which can be further explored. Studies on FSSAI regulations compliance by processed food corporates, how much of the information on food labels is actually comprehendible and usable, the impact of nutritional labels on purchases made by children, and food labels as a tool in branding are some of the areas which mandate further study. Moreover, rural India is demonstrating significant purchase potential, therefore, a study of efficacy of the nutrition label as a communication tool for the rural populace must be explored.

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