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Assessing the Information Seeking Behavior of Urban Farmers to Design an Integrated Extension Model

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Even though the urbanisation is considered as a development indicator, the tremendous migration from rural areas to urban areas leads to serious environmental, health and economic issues. Due to the space and time constraints, the urban entity used to depend on rural community for their food products. But in the same time, highly priced demand for land and the lesser profit from farming results in withdrawal of rural farmers from farming. And these above mentioned factors contributed to a gap in supply and demand for food. This gap leads to the non-availability of nutritious food and thereby, made difficult for urban dwellers to access it due the high price. And the result was seen as a double burden in the form of malnutrition and obesity among urban dwellers. The concept of Urban Farming can bring back the traditional homestead farming culture and more than that, a nutritionally secured and environmentally sustainable society. As most of the urban dwellers are new to this setup, they need information and assistance for bring it in a successful way. Hence, there is a necessity for understanding their information needs, and the sources currently they are depending. The present study focuses on the information seeking behaviour and its utilisation constraints experienced by the farmers in an urban community. The study was carried out in the

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period from December 2020 to March 2021 in Ernakulam and Calicut districts which ranks first and third in degree of urbanisation in Kerala respectively. From the findings of the study it is understood that, their information needs varies from the selection of nutritious food crop to marketing of surplus quantity produced. The constraints analysis could give suggestions for improvement and it can narrow down the gap between farmers - extension system. Based on this, an integrated urban farming extension model has been designed for the effective information dissemination to the farmers. This can save time of farmers and efforts of extension agents, and it will motivate them towards potential adoption of more technologies.

Keywords: *Information seeking behaviour; urban farming; nutritional security; extension system.*

1. INTRODUCTION

The era of 21st century could be denoted as a "city growth" period. Because, the social transformation of urbanisation could completed in developed countries and it is in its peak in the case of developing countries. As a developing country like India, the statistical data of 2020-2021 shows that, approximately a third of the total population in India lives in cities and over the last decade, urbanization in India has increased by almost 4 per cent [1]. UN's projection data shows that, the urban population of India will be approximately 40 per cent by 2030 [2,3]. Even though urbanisation is considered as an economic development indicator, migration from rural areas to urban areas leads to serious environmental, health and economic issues. This rapid expansion of urban areas has resulted in shrinkage of land availability for activities other than housing purposes. Due to the space and time constraints, the urban entity used to depend on rural community for their food products

But as the situation changes, the picture of agricultural production in rural areas also changed. There was a shift in the cropping pattern, from food crops to cash crops which are found to be less flexible with the climate and more profit oriented. along with this, high demand and price for land has caused the withdrawal of farmers from farming activities and migration to urban areas. The increased industrialisation attracted the rural youth to move to cities and it stopped the active involvement of youth in agriculture. These factors contributed to a gap in supply and demand for food in urban areas and this gap leads to the non-availability of nutritious food and thereby, made difficult for urban community to access it due to the high price. The effect was seen as a double burden in the form of malnutrition and obesity among urban dwellers. Hence there exists an urgent need for self-sufficient and sustainable agricultural

production system for the urban entity of the country.

Urban farming is an idea that changes the concept of "landscape to Foodscape" at household level. Previously the city dwellers were eager to utilise their nearby small available spaces for landscape purposes. But now the situation has been changed and it made them to rethink and move towards "foodscape" concept for their survival. Urban Agriculture can be defined as growing crops and maintaining livestock within the limits of towns and city areas for their self-consumption and sometimes marketing of their surplus quantities [4]. It can be called as a food system which includes not only the cultivation and rearing but also the harvesting, post-harvest handling, storing, processing and marketing. In earlier days we had a culture of growing crops for our own consumption in our backyards.

Resource challenges made the farmers to adopt methods ranges from private home garden to community farms, indoor farms, grow bags, rooftop garden, cage structures animal rearing, aqua ponics, hydroponics and vertical farms.

Urban farming is not just about food production for self-consumption. It may create distinct benefits for women in low-income countries (e.g., financial, economic and social advancement) as well as allow them to contribute to household food production, supply and income amid childcare responsibilities [4]. Beyond the nutritional benefits, urban farming provides opportunities for physical exercise and increased well-being. Studies shows that, participating in urban agricultural activities with a variety of therapeutic benefits including stress reduction, cognitive stimulation, spending time outdoors connecting with nature, and creating a sense of accomplishment [5].

1.1 Information Seeking Behaviour

When an urban farmer comes with mind set to cultivate in his space, he first looks for the information with which he can do something good. Agricultural information can be defined as any information which is verbal or non-verbal, printed or virtual on any aspects of agricultural system which will help the farmers in decision making process. It is considered as the basic input which controls any other production practices whether it is money, chemicals or labour involved. So, by getting timely, relevant, rightful information to farmers help them to take proper decisions in farming activities. It's very important for them to get updated information about new technologies, innovations in marketing, and production practices to manage with the competition [6].

Before providing the information to farmers, it is important to analyse their information seeking behaviour which includes the sources on which they are depending and their information needs. Especially in the case of urban farmers, they are new to this space limited cultivation practices. So they need specific information which is relevant to their system of cultivation. There are many studies which revealed the importance of information in agricultural system. The forms of information sources include verbal, printed, written and softcopy of sources and among them farmers found to be depends mainly on printed sources [7]. Studies reveal that internet and other social media platforms were found to be major information sources among the urban farmers [8]. Not only the internet and social media platforms but also radio/ television in local dialect can enhance the timely dissemination of information [9]. Among different types of information needs, like climate changes, marketing, livestock rearing the major need was found was crop production activities [10].

2. METHODOLOGY

In 2011 census, the Kerala state had 47.72 per cent of the population living in urban areas. Each of the districts has improved their urban percentage during 2001-2011 and the percentage increase ranges between 15 to 40 per cent. The urban sector of Kerala consists of 6 municipal corporations and 87 municipalities. The highest percentage of urban population is in Ernakulam district followed by Thrissur and Calicut. There are many Government schemes which are aimed for improving the farming activities in urban areas. A major scheme, Wick

Irrigation was implemented through Krishi Bhavans and hence the beneficiaries under the wick irrigation scheme were selected for the study. From each corporation, three prominent Krishi Bhavans with highest number of beneficiaries of the scheme were considered for the respondents' selection. One third (33.33 per cent) of the total active participants were considered as the sample for the study and accordingly the sample size was fixed as 189 respondents. The sample respondents were selected from the above two corporations by employing proportionate random sampling technique.

Ex post facto research design was used in this study to suit the objectives and type of information needed. Taking into consideration of the objectives of the study, data were collected using a well-structured interview schedule after pre testing. The data were collected by personally interviewing the respondents during the period from December 2020 to March 2021. Descriptive and inferential statistics tools were used to analyse the data collected. Statistical analyses were performed using Statistical Package for Social Sciences (IBM SPSS 21.0) and MS Excel.

3. RESULTS AND DISCUSSIONS

3.1 Socio-demographic Characteristics of Respondents

The age distribution shows that more than one third (68.80 per cent) of the respondents are belongs to the age category of above 45 and nearly one fourth (23.80 per cent) were in the middle aged group. A few respondents (7.40 per cent) were found in the young aged category. And most of among them were retired officers. The data also revealed that more than half of them were occupied with agricultural activities along with their retirement life. They are utilising their free time for thoughtful farming activities as they couldn't do it before because of their job. Even though they are not income oriented they are able to produce small economic benefits out of that and they could reduce their family budget share for food purposes. Majority of the respondents (90 per cent) have education at least secondary school level. As we have seen above most of them were retired officials they were educated and half of them were having graduation also. More than three fourth (77.80 per cent) of them had less than 10 years of experience in farming activities. A very small

number of famers (10 per cent) had experience more than 20 years.

This may due to as we mentioned above most of them were working and they became active in farming only after their retirement. The distribution of respondents based on the nature of cultivation practices they are following, it is revealed that more than half of them were following organic practices. This may because the farmers are not profit oriented and they mainly aim for self-consumption and sharing of products to family and friends. They used to market their surplus quantity of products only. Nearly one third of the farmers are following traditional practices by using both organic methods and chemical inputs. But they believe that they are following organic method because of their unawareness about the proper organic practices.

3.2 Information Needs of the Urban Famers

The seriousness given by the farmers to each information needs was measured by considering

12 dimensions of needs and ranked them based on the computation of information need index.

The Information Need Index (INI) was computed using the following formula,

$$INI = \frac{\text{serious need} \times 3 + \text{Not a seriuos need} \times 2 + \text{Not a need} \times 1}{\text{Maximum possible score}} \times 100$$

The study results shows, information about Disease and pest management ranked first with an Information Need Index (INI) of 90.30. The need for information on input purchasing and marketing of produce ranked second and third with INI value of 88.01 and 85.01 respectively. Followed by this, information needs on improved cultural practices (77.78), and storage of the produces (75.84) also had importance in the farmers' priority for information needs. The information about the use of agrochemical inputs, purchase of protected cultivation structures, events forthcomings, and mushroom cultivation were found to be less prioritized and ranked 9th, 10th, 11th and 12th respectively.

Table 1. Socio economical characteristics of the respondents

Sl. No	Variables	Frequency	Percentage
1	Age		
	Young	14	7.40
	Middle	45	23.80
	Old	130	68.80
2	Educational status		
	Primary and Upper primary	11	5.80
	Secondary and higher secondary/ vocational	55	29.10
	Graduation	90	47.60
	Post-Graduation	33	17.50
3	Occupational Activity		
	Agriculture and allied Activities	24	12.70
	Salaried Employment	58	30.70
	Retired	33	17.50
	Retired + agricultural activities	36	19.00
	Business	24	12.70
	Income from Abroad	14	7.40
4	Years of practicing urban farming		
	1 to 5	73	38.60
	6 to 10	74	39.20
	11 to 15	31	16.40
	16 to 20	5	02.60
	More than 20 years	6	03.20
5	Nature of cultivation practice		
	Organic practices	105	55.60
	Commercial practices (Fully inorganic)	39	20.60
	Traditional practices (both chemical and organic)	45	23.80

The study revealed that, more than half of the urban farmers were following organic practices and hence the usage of chemical pesticide was less. This has resulted in occurrence of pests and other diseases very often. Consequently, they need information about organic cultivation practices for crop protection and hence this information need stood first. Moreover they are not farmers by profession, they are not able of distinguish the symptoms which are pest related, diseases and climate related. Hence, they couldn't do proper management practices. On that account, they need updated information about the crop protection aspects.

Following to this, with a INI value of 88.01 the information need about where to purchase the inputs ranked second. Among the inputs, purchase of seed was their major constraints. They used to buy from fellow farmers or from input shops for hybrid seeds of vegetables. Even though they are willing to buy local varieties of seeds from state farms they were not able to make it available before the sowing time. Thus, again they have to depend on input dealers.

Most of the city growers are cultivating the crops for their own needs. They have surplus quantity after their consumption but insufficient for proper regular selling. This made them difficult to manage this surplus products and this could be the reason they sought information about marketing options possible for them and this was placed in the third position.

Space is considered as the major constraint among the urban farmers and hence they were

mostly following grow bag cultivation and terrace farming in a congested manner without considering the space requirements. Further, they were unaware of the recommended cultural practices that could be possible in this kind of space constrained situations and improved technologies which could tackle this issue. As a result, their productivity was less and pest and disease attack were more. Hence, they could have sought information about improved cultural practices and given the fourth rank.

Vegetable is considered as a highly perishable product and majority of the respondents had vegetable cultivation as a main component and hence the need for information on appropriate storage found to be important. And they need to know how to manage the surplus quantity after their self-consumption and hence it was given sixth rank.

During the discussion it was found out that the respondents had poor awareness on the improved practices like vertical farming, hydroponics and aquaponics and hence their needs on information about the same also said to be low. Their participation in agricultural shows and workshops were very low. They didn't consider them as better information sources. As a result of this, the information on forthcoming events was less prioritized. For most of the respondents the mushroom cultivation was a failure and it was a less used component among the urban farmers. Hence, the information regarding the same was found to be ranked last in the list.

Table 2. Rank order of the dimensions of information on the basis of INI

S. No.	Information needs	Information Need Index (INI)	Rank
1.	Disease and pest management	90.30	1
2.	Where to access credit facilities and subsidies	63.32	6
3.	Where to purchase input	88.01	2
4.	Forthcoming events (About agricultural seminars, exhibitions etc)	43.92	11
5.	Mushroom cultivation	40.74	12
6.	Where to purchase protected cultivation structures	52.73	10
7.	Use of agrochemical inputs	54.14	9
8.	Storage of produce	75.84	5
9.	Marketing of produce	85.01	3
10.	Improved cultural practices	77.78	4
11.	Hiring of agricultural implements	56.79	8
12.	Animal husbandry management	58.20	7

3.3 Use of Information Sources by the Urban Farmers

The degree of importance given by the farmers to each information sources was measured by considering 10 different sources of information and ranked them based on the computation of Information Source Use Index (ISUI).

It was computed using the following formula,

$$\text{ISUI} = \frac{\text{major source} \times 3 + \text{Minor source} \times 2 + \text{Not a source} \times 1}{\text{Maximum possible score}} \times 100$$

From the table, it is agreed that, there is only a small difference between the Information Source Use Index value of their Agricultural officers and Friends, family and neighbours. The Agricultural Officers were ranked first with highest ISUI value (82.54) followed by Friends, family & neighbours with ISUI value of 81.83. The experience of the farmers ranked third and farmers societies were placed in the 4th position. The sources like print media, NGOs and agri.shows and workshops were found to be the least sources and ranked by 8th, 9th and 10th positions respectively.

The rapport with the Agriculture officers is evident from the table. Especially in Kochi Corporation, most of the respondents were working. And in both corporations, the AOs have started a whatsapp group forum connecting interested farmers for information sharing and it made the farmers to connect not only with the officer but also with the nearby fellow farmers. Thus the farmers are connected to avail the subsidies and inputs. This could be the reason, the AOs were placed in the top rank.

The kinship group also found to be a very effective source as Agricultural officers. This group includes fellow farmers, members of their residential association and active farmers among

their relatives. In most of the cases, the crops growing and methods practicing are same in each residents associations. Their guidance and information sharing between the residents association members helped them to increase their knowledge and skill in cultivation practices.

It has already been reported that, more than half of the respondents had 6 to 15 years of experience. This could have contributed to the third rank given to their own experience as the information source.

The Government has started schemes and subsidies for agricultural production group activities in urban areas. Under the Vegetable Development scheme, in every residents association, the similar minded members formed themselves into a group and they started to do some agricultural activities in the available vacant spaces or leased land. In such a way, they maintained good rapport between them and shared information among themselves and hence it was placed in the 4th rank (Farmers societies and clubs).

As majority of the farmers were depending on private input shops for buying planting materials especially seeds, it acted as an important information source and it was placed in the 5th position. The use of internet and other social media platforms were ranked 6th in the study. They opined that, the internet is an information crowd and states that the reliability of the information available through the internet is not assured. The major internet platform which they found as useful is YouTube.

Even though ATMA is working in both corporations, it is not much active and the farmers are less dependent on ATMA for information and it was placed in the 7th rank.

Table 3. Rank order of the sources of information on the basis of ISUI

S. No.	Information sources	Information Source Use Index (ISUI)	Rank
1.	Their own experience	79.01	3
2.	Friends, family and neighbours	81.83	2
3.	Print media	48.68	8
4.	Internet and other medias	59.96	6
5.	Agri.shows and workshop	42.86	10
6.	Agricultural officers	82.54	1
7.	ATMA agents	57.67	7
8.	Agricultural input shops	63.32	5
9.	Farmers societies and clubs	75.84	4
10.	NGOs	44.27	9

The use of print media was also less compared to other sources on which they said, the weekly half page in newspaper is not much useful. A private magazine named 'Ente Harithamuttam' by Mr.Benny Alexander of Harithakeralam news was found to be used by the urban famers of Calicut Corporation. Even though they have an NGO named NIRAVU nearby them, nobody is using as a major source and hence the above two sources have obtained the least two ranks.

3.4 Constraints for Information Seeking

From the analysis of constraints felt by the urban farmers, those relating to information seeking has been identified and ranked based on the multiple response percentage. The graphical representation of the constraints was given below in Fig. 1.

From the Fig. 1, it is evident that, the major problem felt by the farmer was the lack of awareness about the selection of information sources. According to them, they have come across so many information sources like private input dealers, magazines published by Govt. and private agencies, internet and other social media platforms etc. since they are following their own experience and farmers club as their major source, most of them are unaware about the updated technologies and modern day practices like aquaponics, hydroponics etc. Since they don't have a basic idea, even if they are interested in adoption of innovations, they are little bit afraid of the trustworthiness about the sources of information.

The second ranked constraint was unspecific information. Since they have space limitation in cultivation, they need information which is

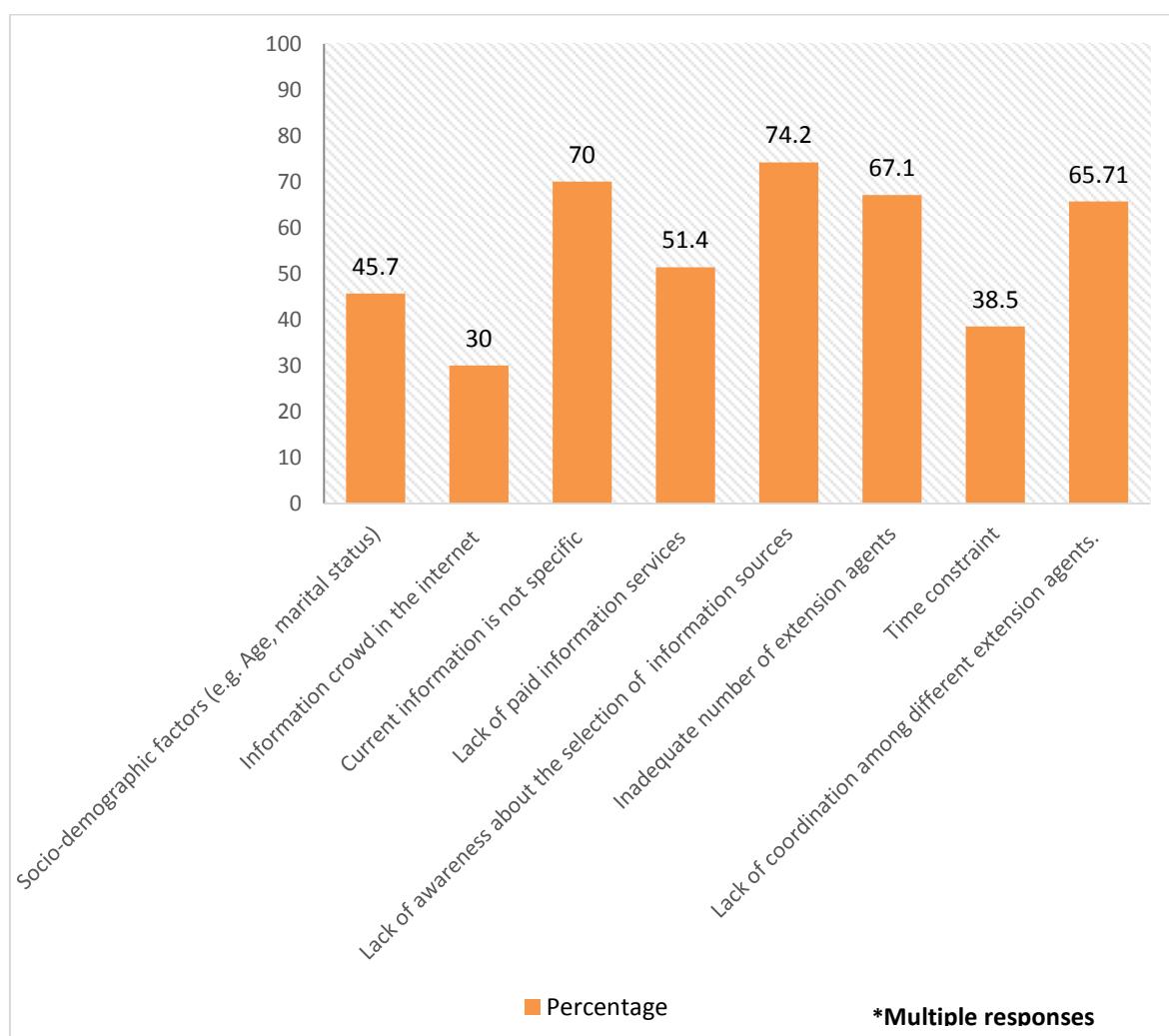


Fig. 1. Distribution of the respondents based on their constraints

matching to their farming conditions. And most of them are expecting information very specific to organic cultivation practices. In the same way they can't depend on commonly available marketing mechanisms such as VFPCK and online marketing since they don't have enough products for that.

The difficulty with the less number of extension agents and lack of coordination between agencies were ranked as 3rd and 4th constraints for them. The tremendous clerical works in the Krishi Bhavans made the Agricultural officers to reduce the number of visits to field. So farmers are not getting a regular check-up visit from them. And also, the lack of coordination between different agencies like Krishi Bhavans, ATMA, animal husbandry office made the farmers very difficult to connect with them. As all of them are working as a separate unit the farmers have to invest more time in contacting with them. The lack of paid information services ranked 5th in difficulties faced by the farmers in seeking information. Even if they are willing to pay for the information, they don't have such sources. According to them the paid services will be more reliable and they believe that since they are paying they can question them also.

Socio demographic factors like age was found as a constraints during the analysis. Among the two third respondents of above 45 aged categories, nearly forty per cent were found as retired professionals. Hence, sometimes they have to depend on others to connect with the information sources and this made difficult for them. Even though internet is considering as a easily accessible information source, the information overload made the farmers difficulty in choosing it as a source.

3.5 Suggestions for Developing an Integrated Extension Model for Information Dissemination

The constraints analysis could give suggestions for improvement and it can narrow down the gap between farmers - extension system.

1. Rebuilding the Govt. extension system

- First Govt. should make available enough number of Agricultural Officers in the KBs. The ratio between farmers to Agricultural officers should be reduced.
- Make utilise the Post Graduate students as subject matter specialists in their own

fields. They can be appointed as internship program or training program to each area. For example, crop protection students for pest and disease management, Agronomy students for possible cultural practices, Extension students to demonstrate new technologies to them, MBA students to marketing options for their products. This will provide benefits to both, students get experience and a small financial support and the farmers will get subject matter information.

- Coordinate all available extension agents in a single platform. This will save both farmers and extension agents time and labour.
- Provide a separate platform for subsidies and implementation of Govt schemes. This will help to save the time of Agricultural Officers and they can continue their regular visits to farms

2. Information sources as a Public Private Partnership model

- This will be useful for the farmers who all are willing to pay for the information and for make them easily accessible

3. Build separate marketing strategies for urban farmers

- Most of the farmers are following vegetable cultivation practices hence local storage facilities for this products can make them to market it easily

4. Conducts trainings on specific topics

- The cultivation practices of urban farms are different from normal field farming. Hence they need specific training for this.

5. Help them to start new information sharing platforms

- The study reveals that they have a better knowledge sharing culture. By using this we can start social media platforms, use of FM Radio, small publications like "city letters". This can be done through resident associations or ward basis.

6. Coordinate common input purchase system

- As they have very small area for cultivation, they need small quantities of

inputs. Especially for better quality seeds, fertilizers, etc. so by making a common input purchasing coordination system will make them convenient for the same.

Based on this, an integrated urban farming extension model has been designed for the effective information dissemination to the farmers.

4. CONCLUSION

The need of self sufficiency in food production was clearly evident when the COVID pandemic attacked the world. As a result of the lockdowns, in movement restrictions both for people and logistics and it had impact on limited access towards markets. It was the time everyone started to think not only about the quality but also very importantly about the quantity. A better planning and a well-designed extension system can develop an urban food system in our cities and thereby assuring not only the food availability but also the food stability. Analysis of Information seeking behaviour could help to overcome the gaps in the knowledge level of the farmers save time of farmers and efforts of extension agents, and it will motivate them towards potential adoption of more technologies.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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