

BIBLIOGRAPHY

ELIAS, JANICE U. APRIL 2012. Awareness on the Hazardous Effects of Pesticides in Vegetable Consumption. Benguet State University, La Trinidad, Benguet.

Adviser: Evangeline B. Cungihan, MSc

ABSTRACT

This study was conducted to identify the consumers' awareness on the hazardous effects of pesticides in vegetables consumption in La Trinidad Benguet.

There were a total of 100 respondents from the different group consumers. Majority of them are female, married and have attained college level. To gather the needed data , a survey questionnaire was prepared and distributed to the respondents.

As to their occupation, most of the respondents are working with blue collar jobs which include occupation such as farming, driving, laborer, and janitors. Majority of them are having household consumers size of 1-3 person. Most of the respondents are consumers of conventional vegetables. Among the main reasons for consuming conventional grown vegetables is basically because it is cheaper than the organic vegetables. The findings show that most of the respondents bought vegetables direct from farmers.

Most of the respondents are aware on the hazardous effects of pesticides. On the part of the respondents that are not aware on the hazardous effects of pesticides applied to vegetables, majority of their reason is that lack of information and it is because of their low educational attainment. As to the strategies of the respondents to avoid or lessen the effects



of pesticides on health, most of the respondents are very frequent in simply washing the vegetables before cooking.

Majority of the respondents continue consuming conventional vegetables because they believe that the pesticides sprayed in the vegetables can be washed and it can evaporate. Lastly, some said they have no choice because it is the only cheap and readily available.



RESULTS AND DISCUSSION

General Information of the Respondents

Table 2 presents a brief profile of the respondents in terms of the following variables; a) age, b) gender, c) civil status, d) educational attainment, e) occupation, f) number of household consumers.

Age. Out of 100 respondents there were 33% who belong to the age bracket of 17-26 years old. Forty one percent of the respondents belonged to the age bracket of 27-36 years old, 10% to 37-46 and 16% 47-56 years old.

Gender. Majority (58%) of the respondents were female, while 42% were male.

Civil status. Out of 100 respondents 39% were single and 61% were married.

Educational attainment. The table shows that all of the respondents had gone to school. However, respondents differ on their educational attainment. There were 5% who finished elementary level, 24% high school level and 71% finished college level. This finding shows that majority of the respondents had had higher level of formal education.

Occupation. The table shows that many (40%) of the respondents were unemployed. There were 24% of the respondents working in white collar jobs. They maybe working as professionals, office workers, businessman, clericals, administrators or managers, 36% have blue collar jobs which includes occupation such as farming, driving, laborers, and janitors.

Number of household consumers. The result shows that 46% have a household size of 1-3 consumers, 33% with 4-6 consumers, and 21% with 7-9 consumers.



Table 2. Respondents' profile

PARTICULARS	FREQUENCY	PERCENTAGE
Age		
17-26	33	33
27-36	41	41
37-46	10	10
47-56	16	16
TOTAL	100	100
Gender		
Male	42	42
Female	58	58
TOTAL	100	100
Civil status		
Single	39	39
Married	61	61
TOTAL	100	100
Educational attainment		
Elementary	5	5
High school	24	24
College	71	71
TOTAL	100	100
Occupation		
White collar job	24	24
Blue collar job	36	36
Unemployed	40	40
TOTAL	100	100
Number of household consumers		
1-3	46	46
4-6	33	33
7-9	21	21
TOTAL	100	100



Type of Vegetables Bought by the Respondents

Table 3 shows that 59% of the respondents buy and consume purely conventional vegetables and 41% buy and consume both organic and conventional vegetables. The result shows that more consumers are consuming purely conventional vegetables than those who consumed a combination of organic and conventional vegetables.

Vegetables that are Usually Bought by the Respondents per Week

Table 4 present the distribution of respondents according to the vegetables they usually buy and consume. The vegetables usually bought and consumed by the respondents are potato, camote tops, cabbage, chayote, petchay, carrot, and beans. The finding shows that for conventional vegetables, most of the respondents frequently buy potato and Chinese cabbage with weighted mean of 3.88 and 3.90, respectfully on the other hand, celery and cauliflower were seldom consumed. The rest of the vegetables were consumed sometimes. For the combination of organic vegetables and conventional vegetables, lettuce, and petchay were frequently bought and consumed as indicated by their high weighted mean value of 3.54. Potato and celery were seldom consumed as shown by the weighted mean of 2.22 and 1.93, respectively. The other vegetables; Chinese cabbage, cabbage, chayote, carrots, beans, camote tops, cauliflower, and broccoli were sometimes consumed. This finding implies that the frequency of buying most of the vegetable per week is sometimes.



Table 3. Types of vegetable usually bought by the respondents

TYPE	FREQUENCY	PERCENTAGE
Conventional	59	59
Both organic and conventional	41	41
TOTAL	100	100

Table 4. Kinds of vegetables usually bought by the respondents and frequency of buying per week

PARTICULAR	CONVENTIONAL		BOTH	
	MEAN	DESCRIPTION	MEAN	DESCRIPTION
Chinese cabbage	3.90	Sometimes	2.61	Frequent
Potato	3.88	Frequent	2.22	Seldom
Cabbage	3.27	Sometimes	3.17	Sometimes
Lettuce	2.63	Sometimes	3.54	Frequent
Celery	2.27	Seldom	1.93	Seldom
Chayote	3.24	Sometimes	2.95	Sometimes
Petchay	3.49	Sometimes	3.54	Frequent
Carrot	3.08	Sometimes	3	Sometimes
Beans	3.46	Sometimes	3.39	Sometimes
Camote tops	3.20	Sometimes	2.95	Sometimes
Cauliflower	2.78	seldom	2.71	Sometimes
Broccoli	2.66	Sometimes	3.34	Sometimes

Numerical value and descriptive equivalent

1-1.50 Never

1.51-2.50 Seldom

2.51-3.50 Sometimes

3.51-4.50 Frequent

4.50-5 Very Frequent



Reasons for Buying Conventionally Grown Vegetables

As found earlier there were more respondents that consumed conventional vegetables than those who consumed both organic and conventional vegetables (Table 5). Forty four percent of the respondents for conventional vegetables strongly disagreed that conventional vegetables are cheaper than organic vegetable while 27% for the consumers of both organic and conventional vegetable strongly disagreed. To these consumers they perceived that conventional vegetables are as expensive as organic vegetables. However, the weighted mean showed an average of 4.22 for consumers of conventional vegetables and 3.98 for consumers of organic vegetables. Both means have the same description which is agree. This implies that on the average, consumers perceived that organic vegetables are more expensive than conventional vegetables. Another reason for buying conventionally grown vegetables is that they are available in all markets compared to organic vegetables which are only sold in specific market. Both type of respondents agree on this reason. Another reason given was that they buy conventionally grown vegetables because there is no differences with the organic vegetables. The finding showed that both type of respondents were uncertain on this aspect. Both types of respondents agreed that organic vegetables are expensive. On the issue that organic vegetables are limited, consumers of purely conventional vegetables agreed but consumers of both organic and conventional vegetables were uncertain. On the issues that there is lack of information about organic vegetables; conventional vegetables improves health; and conventional vegetables are nutritious and safe to eat, both type of consumers were uncertain.



Table 5. Reasons for buying conventionally grown vegetables

PARTICULARS	1		2		3		4		5		AVE.	DESCRIP-TION
	F	%	F	%	F	%	F	%	F	%		
Conventional Vegetables												
Cheaper than organic vegetables	26	44	24	41	5	8.5	4	6.8	0	0	4.22	Agree
Available in all market	19	32	26	44	10	17	2	3.4	2	3	3.98	Agree
There are no difference with organic vegetables	5	8.5	19	32	24	41	6	10	5	8	3.22	Uncertain
Organic are very expensive	18	31	30	51	4	6.8	6	10	1	2	3.98	Agree
Organic have limited supply and not available in any market	15	25	31	53	6	10	6	10	1	2	3.89	Agree
Lack of information about the organic vegetables	5	8.5	16	27	15	25	16	27	8	14	2.95	Uncertain
Improves consumers health	6	10	11	19	29	49	10	17	3	5	3.12	Uncertain
Nutritious and safe to eat	3	5.1	10	17	29	49	6	10	5	8	2.69	Uncertain
Both Vegetables												
Cheaper than organic vegetables	11	27	18	44	12	29	0	0	0	0	3.98	Agree
Available in all market	11	27	15	37	14	34	1	2.4	0	0	3.88	Agree



Table 5. continued...

PARTICULARS	1		2		3		4		5		AVE.	DESCRIP- TION
	F	%	F	%	F	%	F	%	F	%		
No difference with organic vegetables	4	9.8	12	29	16	39	5	12	4	10	3.17	Uncertain
Organic vegetables are very expensive	7	17	11	27	20	49	2	4.9	1	2	3.51	Agree
Organic have limited supply and not available in any market	6	15	11	27	19	46	2	4.9	3	7	3.37	Uncertain
Lack of information about the organic vegetables	4	9.8	10	24	14	34	6	15	6	15	2.93	Uncertain
Improves consumers health	3	7.3	7	17	17	41	8	20	6	15	2.83	Uncertain
Nutritious and safe to eat	9	22	8	20	17	41	9	22	4	10	3.66	Uncertain

Numerical value and descriptive equivalent

1-1.50 Strongly Disagree

1.51-2.50 Disagree

2.51-3.50 Uncertain

3.51-4.50 Agree

4.50-5 Strongly Agree

Frequency of Buying from the Different Market Outlets of Vegetables by Type of Respondents

Table 6 shows the different market outlets were the respondents used to buy their vegetables and the weighted mean on the frequency of buying from the market outlets. For the consumers of purely conventional vegetables their usual place of buying vegetables



were Baguio Public Market with a mean frequency of buying of 2.78 which means sometimes. The other markets and the mean frequency of buying by the respondents were: La Trinidad Trading Post (3.46), La Trinidad Public Market (3.32), Side Walk Vendors (2.88), and direct from the farmers (2.97). All the mean frequencies are interpreted as sometimes. For the consumers of both conventional and organic vegetables, the place of buying vegetables and the mean frequency of buying were side walk vendors (2.71), sometimes; direct from farmers (3.61), frequent; LaTop (2.19), seldom; and BSU Organic Market (2.05), seldom.

Table 6. Weighted mean on the frequency of buying from the different market outlets of vegetables by type of respondents

PARTICULAR	CONVENTIONAL		BOTH	
	MEAN	DESCRIPTION	MEAN	DESCRIPTION
Baguio public market	2.78	Sometimes		
La Trinidad trading post	3.46	Sometimes		
La Trinidad public Market	3.32	Sometimes		
Side Walk Vendors	2.88	Sometimes	2.71	Sometimes
Direct from farmers	2.97	Sometimes	3.61	Frequent
LaTop			2.19	Seldom
BSU Organic Market			2.05	Seldom

Numerical value and descriptive equivalent

1-1.50 Never	3.51-4.50 Frequent
1.51-2.50 Seldom	4.50-5very Frequent
2.51-3.50 Sometimes	



Level of Awareness of Respondents on the
Hazardous Effects of Pesticides
Applied to Vegetables

The findings in Table 7 shows that consumers of purely conventional vegetables were aware (as indicated by the weighted mean on the level of awareness) on the following effects of pesticides applied on vegetables; it can cause cancer (3.85), pesticides are dangerous to man and animals (3.80), pesticides can cause food toxicity (3.90). The respondents were slightly aware on the following aspects: it can damage the immune system (3.22), it can cause irritation on the skin and eyes (3.53), it can cause sneezing and coughing (3.34), it can cause dizziness (3.07), it can cause burning sensation to the nasal passages and chest (3.08), and it can cause vomiting (3.19). Their overall level of awareness mean was 3.44 equivalent to slightly aware.

For the consumers of both organic and conventional vegetables, their level of awareness on all the hazardous effects of pesticides on health is slightly higher than the first group of respondents. Their level of awareness in all the effects was aware, except for causing burning sensation to the nasal passages and chest which was slightly aware. A comparison was made to the level of awareness of consumers of purely organic vegetables and the results revealed that this group of consumers were very much aware on all the hazardous effects of pesticides on health.

Results of the statistical test on the differences on the level of awareness between the three groups of consumers showed that there were significant differences on their level of awareness. This implies therefore that consumers of purely conventional vegetables were the least aware on the hazardous effects of pesticides.



Table 7. Level of awareness on hazardous effects of pesticides applied to vegetables

PARTICULAR	CONVENTIONAL		BOTH		ORGANIC		FC
	MEAN	DESCRIP.	MEAN	DESCRIP.	MEAN	DESCRIP.	
It can cause cancer	3.85	A	4.02	A	5.00	VMA	13.64**
Dangerous to man and animals	3.80	A	3.88	A	4.95	VMA	13.27**
It can damage immune system	3.22	SA	3.68	A	5.00	VMA	21.13**
Irritating to the skin and eye	3.53	A	3.68	A	5.00	VMA	13.56**
Sneezing and coughing	3.34	SA	3.56	A	5.00	VMA	17.26**
Causes dizziness	3.07	SA	3.51	A	4.90	VMA	23.33**
Burning sensation to the nasal passages and chest	3.08	SA	3.29	SA	4.55	VMA	14.53**
It can cause vomiting	3.19	SA	3.54	A	4.90	VMA	19.10**
Food toxication	3.90	A	4.05	A	5.00	VMA	9.59**
OVERALL MEAN	3.44	SA	3.69	A	4.92	VMA	17.36**

**highly significant ($p \leq 0.01$)

Numerical value and descriptive equivalent

1-1.50 Not Aware (NA)

2.51-3.50 Slightly Aware (SA)

4.50-5 Very Much Aware (VMA)

1.51-2.50 Uncertain (U)

3.51-4.50 Aware (A)



Reasons of Respondents for being Not Aware

Some of the respondents were not aware on the hazardous effects of pesticides due to some reasons as presented in Table 8 as follows: not informed, did not experience it, lack of information, and low educational attainment. Most of the conventional consumers are not aware because of lack of information, 75% is because low educational attainment, 67% are not inform about the effects of the pesticides applied to vegetables the same with the reason that they are not aware because they did not experience any effects of pesticides applied to vegetable. For the other group of respondents there are 27% lacks of information, 25% low educational attainment and 33% are those who are not inform and did not experience. This result implies that education is really important.

Strategies of Respondents to Reduce the Effects of Pesticides on Health in Consuming Vegetables

As shown in Table 9, most of the consumers of conventional vegetables are very frequent in just washing (88%) the vegetables that they are consuming. Twenty seven percent of the respondents soaked the vegetable in water with salt, and 12% soaked the vegetables in water with baking soda. In the other group of the respondents 71% of the respondents are just washing also their vegetables, 24% soaked in water with salt and 20% soaked in water with baking soda. Majority of the respondents are simply washing their vegetables. Some of them are consuming their own vegetable that's why they know if it is clean and safe to eat or not. It was indicated by the mean average of 4 that majority of the respondents are frequent in the different criteria of strategies to lessen the effects of pesticides on health in consuming vegetable and some are sometimes.



Table 8. Reasons of respondents for being not aware on hazardous effects of pesticides applied to vegetables

REASONS	CONVENTIONAL		BOTH	
	F	%	F	%
I was not inform about it	2	67	1	33
I did not experience it	2	67	1	33
Lack of information	8	73	3	27
Low educational attainment	6	75	2	25

Table 9. Distribution of respondents according to the strategies to lessen the effects of pesticides on health

PARTICULAR DESCRIPTION	CONVENTIONAL		BOTH	
	MEAN	DESCRIPTION	MEAN	
	4.8		4.6	
Washing	8	VF	1	F
Soaked in water with baking soda	2.5	S	2.7	S
Soaked in water with salt	9	S	3.2	S

Reasons of the Respondents Why they Continue Consuming Conventional Vegetables

Table 10 shows the distribution of the respondents why they continue consuming conventional grown vegetables. Out of 100 respondents 74% of them are still consuming conventional vegetables. They have different reasons, there are 71% of the conventional



consumers believed that the pesticides that are applied in the vegetables can be washed, and 29% of the both consumers of organic and conventional vegetables. Some also of the respondents believed that pesticides can evaporate. Most of the respondents said that conventional vegetables are cheap and readily available.

Table 10. Reasons of respondents for continuing to consume conventional vegetables

STATEMENT	CONVENTIONA		BOTH	
	F	%	F	%
The pesticides in the vegetable can be washed	27	71	11	9
Pesticides can evaporate	4	57	3	3
The only food that is cheap and readily available	31	70	3	0



SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

Findings show that most of the respondents are consumers of conventional grown vegetables. Out of 100 respondents there are 41% respondents that are consumers of both kind of vegetable, the organic and conventional grown vegetables. Majority of the respondents belongs to the age bracket of 27-36 followed by 17-26 years old, most of them are female and married. With regards to their educational attainment, majority of the respondents finished college. As to their occupation, most of the respondents are working with blue collar jobs which include occupation such as farming, driving, laborer, and janitors. Others are in white collar jobs which include professionals, office workers, business, clericals, administrators or managers. The other respondents are unemployed which include housewife and students. Majority of them are having household consumers size of 1-3 person followed by 4-6 household consumers. Of the total number of respondents, 59% were consumers of conventional vegetables and 41% were consumers of both organic and conventional vegetables. The respondents have their own preferences in consuming vegetables, most of them buy and consume potato very frequent followed by camote tops and others. Some respondents consume vegetables frequent, others sometimes, seldom and some never try to consume some of the vegetables.

Among the main reasons for consuming conventional grown vegetables is basically because it is cheaper than the organic vegetables followed by organic are very expensive and conventional vegetables are available in all market areas. Some said that there are no difference with organic vegetables and organic have limited supply, others said that it is nutritious and safe to eat and few said they are lack of information about the organic



vegetables. Lastly, some say that it improves consumers' health.

As to the place where respondents bought vegetables, the findings shows that most of the respondents bought vegetables direct from farmers followed by Baguio public market. Some of them bought from La Trinidad trading post and public market. Others are from the side walk vendors, few are in LaTop and BSU organic market this are the consumers of organic vegetables. Most of the respondents are aware on the hazardous effects of pesticides and their primary sources of information are their relative who knows some of it. There are also some that the television is their sources of information and some are from the Department of Agriculture.

On the part of the respondents why some of them are not aware on the hazardous effects of pesticides applied to vegetables, majority of their reason is that lack of information and it is because of their low educational attainment. Some said that they are not aware because they did not experience any of the effects of pesticides that were applied to the vegetables and they were not informed about it.

Based on the level of awareness of the respondents on the listed hazardous effects of pesticides when consuming vegetables sprayed with it, most of them are slightly aware in the different criteria on the level of awareness on the hazardous effects of pesticides applied to vegetable and there are some that are aware especially the organic consumers of vegetables.

As to the strategies of the respondents to avoid or lessen the effects of pesticides on health, most of the respondents are very frequent in simply washing the vegetables before cooking. There are also some who soaked vegetables in water with baking soda and some are in water with salt. Majority of the respondents continue consuming conventional



vegetables because they believe that the pesticides sprayed in the vegetables can be washed and it can evaporate. Lastly, some said they have no choice because it is the only cheap and readily available.

Conclusions

Based on the findings the following conclusions were drawn:

La Trinidad is the major source of agricultural inputs in the province of Benguet and the trading center of vegetables. Almost all of the residents in La Trinidad are consumers of vegetable, many of them have household size of 1-3 some are 4-6 household size.

Majority of the respondents agreed in the different criteria on reasons for consuming conventional vegetables. Conventional grown vegetables are cheaper than organic vegetables and it is available in all markets. Most of the respondents prefer to buy vegetables direct from farmers.

Lack of information is the effect of low educational attainment. It implies that education is really important. The respondents on conventional consumers are aware on the different criteria on the level of awareness of consumers there are some that are slightly aware. The consumers of organic vegetable are very much on the hazardous effects of pesticides, they are more aware than those who are consuming conventional vegetables. Majority of the respondents' strategy to reduce pesticides applied in vegetables is just washing the vegetables before cooking, but there are also some who used baking soda or salt. Some of the respondents continue consuming conventional vegetables because they have no choice, it is the only cheap and sometimes is given by some relatives or friends. It was also found out that washing vegetables with salt or baking soda are not effective in reducing pesticides applied to vegetables, this only serves as preservatives for the



vegetable.

Recommendations

Based on the findings and conclusions the following recommendations are derived.

To farmers the key to reduce health hazards is to limit and use a low-toxicity pesticides when available and don't bring vegetables that are newly sprayed with pesticides in the market even though the price is high. They need instructions on doses, timing and methods of application and safety measures.

They should be provided with safe packaging and label instructions to prevent contamination and mistakes. If possible farmers should stop applying any pesticides in vegetables and practice organic farming. Good agricultural practice should be maintained by the farmers.

To vegetable consumers it is recommended to buy vegetables that are safe to eat, buy organic vegetables. It is better to plant vegetables for your family so that you know that it is safe for your family especially to your children. Organic methods can replace the need for pesticides and chemical fertilizers. As the health experts said that pesticides cannot be eliminated by washing because it is absorbed by the roots and leaves and is trans located to all parts of the plant immediately after it is applied.



LITERATURE CITED

- AGWA, C. and E. PALAYEN, 1999. Baseline Survey of Agribusiness Enterprises in La Trinidad, Benguet. Pp. 1, 3 and 4.
- BERES, S. 2002. Pesticides: Critical Thinking About Environmental Issues, Published by Greenhouse Press. Pp. 37 and 39.
- BOUCHARD, M., D. BELLINGER, R. WRIGHT 2010. Deficit/Hyperactivity Disorder and Urinary Metabolites of Organophosphate Pesticides. Retrieved January 18, 2012 from <http://eartheasy.com/blog/2010/05/6-ways-to-reduce-your-exposure-to-pesticides/>
- CASTRO, E. 1994. Pesticides Destroy Pests' Natural Foes. Manila Bulletin. P. 14.
- CHENG, C. L. and K. R. BERSAMIRA, 2003. Pesticides: Its Hazardous Effect on the Benguet Farmers and the Environment. P. 11.
- FACTOR, F. 2010. Pesticide.org, Earthcares.org, Greenpeas.org. Retrieved August 10, 2010 from <http://factoidz.com/5-harmful-effects-of-pesticide-use/>
- LU, J. L. 2009. Total Pesticide Exposure Calculation among Vegetable Farmers in Benguet, Philippines. Retrieved August 7, 2011 from <http://www.hindawi.com/journals/jeph/2009/412054.html>
- MAYEN, J. 1999. Hazardous Effects of Pesticides. Philippine Daily Inquirer. P. 14.
- NOVOTNY, V., R. TIRADO., D. BEDOYA. 2008. Agrochemicals use in the Philippines and its Consequences to the Environment. Retrieved August 7, 2011 from http://www.greenpeace.to/publications/GPSEA_agrochemical-use-in-the-philip.pdf
- SEVENNO, H. 1994. Put Halt to Pesticide Use. Philippine Star. P. 1.
- ZOSA, M. M. 1997. Restricted Pesticides in the Philippines. P. 4.

