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Bridle

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Consultants

93 ALLPORT ROAD BROMBOROUGH WIRRAL L62 6AB Tel & Fax: 051-644 6627

19th July 1994

CERTIFICATE OF ANALYSIS.

Samples: One sample of Veggi Wash 3.6.94 received from Manufacturing Packaging Services. Valley Way, Welland Industrial Estate, Market Harborough, Leicestershire. 20th June 1994.

Certificate No: 94.3381.MPS
Sample ref: 4F / 1034

Page: 1 of 1

Analysis required: Effect of veggi wash on the removal of Salmonella from the surface of lettuce leaves.

Results:

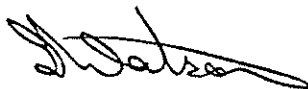
Three Cos lettuces were artificially contaminated with *Salmonella typhimurium* by soaking them in a suspension of these bacteria for 15 minutes. After this time they were shaken to remove the majority of liquid and then allowed to air dry for 1 hour.

One of the lettuces was then transferred to the refrigerator before analysis. Three leaves from a second were washed under cold running water and examined separately for the presence of Salmonella organisms. A further three leaves were washed in a solution of veggi wash made up to manufacturers recommended strength and also examined for the presence of Salmonella organisms. Both of these lettuces were then placed in the refrigerator. Three leaves from the untreated lettuce were examined for the number of Salmonella present on each leaf.

These procedures were repeated after 4, 7 and 10 days. After this time both of the washed lettuces looked fresh but the untreated was starting to wilt and dry out at the edges. The results obtained from analysis were as follows.

	Day 0			Day 4			Day 7			Day 10		
	A	B	C	A	B	C	A	B	C	A	B	C
Untreated	15	18	9	7	11	9	7	9	7	5	5	11
Cold Water Wash	+ve	+ve	-ve	+ve	+ve	+ve	+ve	+ve	-ve	-ve	-ve	-ve
Veggi Wash	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve

Counts are per 100g of lettuce leaf.



D. C. Watson

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19th July 1994

CERTIFICATE OF ANALYSIS.

Samples: One sample of Veggi Wash 3.6.94 received from Manufacturing Packaging Services. Valley Way, Welland Industrial Estate, Market Harborough, Leicestershire. 20th June 1994.

Certificate No: 94.3380.MPS
Sample ref: 4F / 1034

Page: 1 of 1

Analysis required: Effect of veggi wash on the removal of bacteria from the surface of tomatoes.

Results:

Ripe tomatoes purchased from the local greengrocer were examined for Total Bacterial Count on receipt. This was found to be very low and too low to illustrate a significant difference due to various treatments. The surfaces of twelve tomatoes were artificially contaminated with a mixed suspension of bacteria consisting of *Pseudomonas aeruginosa*, *Escherichia coli* and *Bacillus cereus*. This was done by suspending them in liquid containing these bacteria for two minutes, removing them and allowing them to air dry for one hour at room temperature. Four of the tomatoes were then removed to the refrigerator, (a) four were washed under cold running water (b) and the last four rinsed in veggi wash made up in a bowl to the manufacturers recommended strength (c) these six were also placed in the refrigerator for storage before analyses. One sample of each of the three treated batches of tomatoes were analysed for Total Viable Count and *E. coli* Count using in house documented methods based on BS 5763 at day 0 and after 4, 7 and 10 days storage at 4°C. Results obtained were as follows.

	Untreated	Cold Water Wash	Veggi Wash
Day 0 Total Viable Count	1.63 x 10 ⁴	590 (3.6%)	152 (0.9%)
E. coli	2700	103 (3.8%)	21 (0.8%)
Day 4 Total Viable Count	1.94 x 10 ⁴	470 (2.4%)	166 (0.8%)
E. coli	2590	85 (3.3%)	17 (0.7%)
Day 7 Total Viable Count	1.20 x 10 ⁴	532 (4.4%)	138 (1.1%)
E. coli	1980	97 (4.9%)	8 (0.4%)
Day 10 Total Viable Count	1.51 x 10 ⁴	428 (2.8%)	109 (0.7%)
E. coli	2060	86 (4.2%)	8 (0.4%)

All counts are per gramme of whole tomato.


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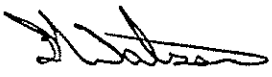


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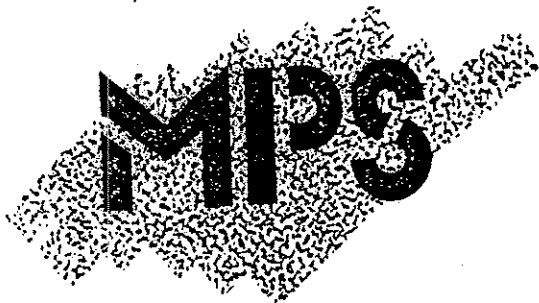
STABILITY TEST CERTIFICATE

Product : VEGGI WASH
Batch : 1453
Storage Period : 12 WEEKS
Date : 25.08.94

Storage Temp	-4 C	R.T	30 C	40 C
Appearance	Conforms	Conforms	Conforms	Conforms
pH 20 C	6.50	6.50	6.51	6.51
Viscosity 20 C	180 c.s.	175 c.s.	170 c.s.	170 c.s.
Specific Gravity 20 C	1.008	1.008	1.007	1.007
Colour	Conforms	Conforms	Conforms	Conforms
Odour	Conforms	Conforms	Conforms	Conforms

Signed  for and on behalf of

Date 30/8/94



Mr. Bruce Green,
Safe and Green Ltd.,
Northampton.

7 August 1992

Dear Mr. Green,

Ref: "VEGGIWASH" - "FRUIT TOO"

This is to re-cap on the protocol work carried out to date on the latest formulation of the above product. A full report will follow upon completion of the low temperature storage trials (September 1992)

The previous data on Veggiwash that we submitted indicated that there was very good potential for the removal of various pesticides and farm sprays used on fruit and potatoes. Our current protocols have addressed the issues of better low temperature storage potential of fragile vegetables and fruits when treated with Veggiwash and also the removal of "diesel fume" deposits.

As you know the testing protocols for the product are very complex and detailed as there are very many issues to be addressed concerning the advantages of Veggiwash over simply washing the fruit or vegetable prior to use or storage. However we are detailing some data taken from the current test studies to demonstrate the the product is effective against the label claims made.

Residue reduction results.

Diphenylamine on apples:

Apples as bought	1.2 mg / kg.
Apples peeled	0.11 mg / kg.
Water washed*	0.84 mg / kg.
Washed with Veggiwash*	0.08 mg / kg.

Please note that peeling removes about 12 to 21 % of an apple or potato which contains useful fibre and vitamins. This generally as viewed by Western standards as a disadvantage because of the low dietary intake of fibre.

Chlorpropham in Potatoes (bought as prewashed)

Untreated	
Chlorpropham	2.35 mg/kg.
Tecnazene	0.4 mg/kg.
2,3,5,6-Tetrachloraniline	0.02 mg/kg.

Washed as directed by Veggiwash

Chlorpropham	0.13 mg/kg.
Tecnazene	0.008 mg/kg.
2,3,5,6 - Tetrachloraniline	0.001 mg/kg.

Diesel fume trials.

For our protocol we took the emission from a small diesel truck and entrained the vapour into a small stainless steel box in which was placed the vegetables. The truck was started up and the product was exposed for exactly one hour to the fumes from the exhaust. This was reviewed as a "worse case situation".

Samples of the vegetables were held for up to ten (10) days at room temperature during which time product was removed and either washed in water or in Veggiwash. The washings were tested for the presence and concentration of diesel derivative deposits (Gas Liquid Chromatography) and comparisons are being evaluated now. The initial impression is that the product washed with Veggiwash is showing a much lower profile than the water washed product. The % reduction ratio is around 87 to 89 but we obviously need to make further studies to complete and verify the data.

Bacteriological storage trials.

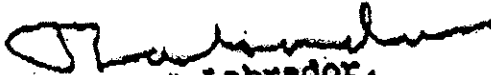
We chose to use lettuce and tomatoes as being useful items to determine if the low temperature storage after treatment with Veggiwash would improve shelf life and prevent undue bacterial/fungal reproduction with down grading of the product.

The test protocol was to wash the product in the recommended dilution of Veggiwash and then store at + 3 to 8° Celsius. Bacteriological determinations were made from representative samples before, during and after storage. This trial is now on-going but preliminary data indicates that the treated product are remaining "fresher" than the water washed product. Our test panel has not yet arrived at a validatable method to assess the mouth feel of the product and other organoleptic tests to determine whether there is an advantage in using Veggiwas or not.

Bacteriologically there is a dramatic reduction on the microbial flora on the surfaces of the test vegetables and fruit after treating with Veggiwash and this therefore would undoubtedly increase the shelf life of the product from a microbiological point of view.

We are trying out test methods on "mouldy" vegetable products to determine if this gross contamination can be controlled and will report to you as soon as possible.

Yours sincerely,


Dr. Jacques Labrador,
Director

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93 ALLPORT ROAD BROMBOROUGH WIRRAL L62 6AB Tel & Fax: 051-644 6627

11th March 1994.

CERTIFICATE OF ANALYSIS

Samples: One sample of Veggi Wash 4.2.94 received from Manufacturing Packaging Services. Valley Way, Welland Industrial Estate, MARKET HARBOROUGH, Leicestershire. 8th February 1994.

Certificate N°: 94.1239.MPS

Page: 1 of 2

Laboratory ref: 4B / 994 - 996

Analysis Required: Examination of effectiveness on freshness and quality of vegetables under "normal" household storage conditions.

Results:

Three fresh Tomatoes were purchased and transferred to the laboratory. One was left untreated ie no wash, the second was washed thoroughly in cold running water and the third washed in veggi wash following the manufacturers instructions. Each was then tested for microbiological quality testing for Total Bacterial Count and Total Coliform Count. An observation was also made as to the appearance and quality of each tomatoe. The three were then stored in a refrigerator at 4°C for up to 7 days. Testing for microbiological quality and appearance were carried out at 3, 5 and 7 days. The results obtained are detailed below.

Certificate No: 94.1239.MPS

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Laboratory Ref: 4B / 994 - 996

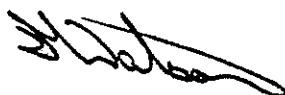
Analysis Required: Examination of effectiveness on freshness and quality of vegetables under "normal" household storage conditions

Results:

	No Treatment		Water		Veggi Wash	
	TVC	Enteroc	TVC	Enteroc	TVC	Enteroc
Day 0	340	<10	210	<10	380	<10
Day 3	980	<10	1640	<10	280	<10
Day 5	7500	30	3040	80	1140	<10
Day 7	8300	50	5100	30	1020	<10

Appearance

All tomatoes appear fresh and firm on purchase and all were ripe to a pale red colour. By the seventh day the untreated sample was starting to look dull and had lost some of its firmness.



D.C. Watson.

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Certificate No: 94.0921.MPS

Page: 2 of 2

Laboratory Ref: 4B / 376

Analysis Required: Examination of effectiveness on freshness and quality of vegetables under "normal" household storage conditions

Results:

Sample A No Treatment
Sample B Cold Water Wash
Sample C Veggi Wash

	A		B		C	
	TVC	Colif	TVC	Colif	TVC	Colif
On receipt	1.95 x 10 ⁵	870	2.09 x 10 ⁵	550	1.72 x 10 ⁵	380
After treatment	-	-	1.62 x 10 ⁵	410	1.16 x 10 ⁵	215
Day 3	8.8 x 10 ⁷	510	4.3 x 10 ⁷	290	4.7 x 10 ⁶	60
Day 5	9.1 x 10 ⁷	70	7.6 x 10 ⁷	230	6.4 x 10 ⁶	20
Day 7	7.3 x 10 ⁷	50	1.2 x 10 ⁸	110	6.0 x 10 ⁶	10

Visual Quality	A	B	C
Day 0	All had firm green leaves no browning or other spoilage.		
Day 3	Still fresh looking no spoilage		
Day 5	Very limp but still green	Firm and fresh looking	
Day 7	No firmness leaves deteriorating green colour fading	Brown edges to leaves. Starting to go limp	No Spoilage leaves still firm and whole

S.A. O'Connell
D.C. Watson.

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TESTING
No: 1077

189 BEDFORD ROAD, ROCK FERRY, L42 2AW. Telephone / Telefax: 051-644 6627

24th February 1994.

CERTIFICATE OF ANALYSIS

Samples: One sample of Veggi Wash 4.2.94 received

Certificate N°: 94.0921.MPS

Page: 1 of 2

Laboratory ref: 4B / 376

Analysis Required: Examination of effectiveness on freshness and quality of vegetables under "normal " household storage conditions.

Results:

Three fresh lettuces were purchased and transferred to the laboratory. One was left untreated ie no wash, the second was washed thoroughly in cold running water and the third washed in veggi wash following the manufacturers instructions. Each was then tested for microbiological quality testing for Total Bacterial Count and Total Coliform Count. An observation was also made as to the appearance and quality of each lettuce. The three were then stored in a refrigerator at 4°C for up to 7 days. Testing for microbiological quality and appearance were carried out at 3, 5 and 7 days. The results obtained are detailed below.

**CONFIDENTIAL
REPORT**



**Campden & Chorleywood
Food Research Association**

RPS/MH/Agric63

CAMPDEN & CHORLEYWOOD FOOD RESEARCH ASSOCIATION
CHIPPING CAMPDEN, GLOS., GL55 6LD

Results of Evaluation of the effect of
Veggi Wash product on removal of Pesticide from
lettuce.

Work carried out on behalf of

Foodsafe

By

Brian Crozier
and
Richard Stanley

March, 1995

Project 21763

Information emanating from this Research Association is given after the exercise of all reasonable care and skill in its compilation, preparation and issue, but is provided without liability in its application and use.

SUMMARY

The effectiveness of the product Veggi-Wash in removing pesticides from produce was examined by analysing lettuce samples, which had previously been found to contain a residue of dithiocarbamate pesticide, after washing with Veggi-Wash.

Veggi-Wash was found to remove some (but not all) of the pesticide residue from the lettuce at both the concentrations employed. Washing with water also removed some of the pesticide residue, but not as much as Veggi-Wash.

DETAILS

Lettuce samples grown by CCFRA as part of another project were washed with two concentrations of Veggi-Wash as well as water (as control) and then analysed for dithiocarbamate pesticide residue content. These samples, including the original samples not washed at all, were all found to contain residues at less than the limit of quantification (0.2mg/kg) and so the effects of washing could not be assessed.

Further samples received at the same time from another source were found to contain measurable residues and so the process was repeated with these samples.

1. Samples were analysed in duplicate.

2. Four "treatments" were tested:

- 2.1. Control sample as received from field
- 2.2. Sample washed in water - running tap water as normal household treatment
- 2.3. Sample washed in Veggi-Wash - according to label instructions, dilution factor 1:200
- 2.4. Sample washed in Veggi-Wash - according to label instructions, dilution factor 1:450

The samples were analysed by method TES-AC-003 which is NAMAS accredited at CCFRA. Residues of dithiocarbamate pesticide present were quantified in terms of the amount of CS_2 liberated and expressed as $mgCS_2/kg$ sample. The Limit of Quantification was 0.2mg/kg.

RESULTS OF ANALYSIS

Sample details	Dithiocarbamate residue found (mg/kg)	Residue remaining as % of original
Lettuce as received	Mean 23.65	100.0
Lettuce washed in water	Mean 19.55	82.7
Lettuce washed in Veggi-Wash concentration 1:200	Mean 1.75	7.4
Lettuce washed in Veggi-Wash concentration 1:450	Mean 1.95	8.2

CONCLUSION

It has been shown that, for the case of a dithiocarbamate fungicide which is non-systemic, any residue remaining on lettuce plants may be significantly reduced by washing the lettuce in Veggi-Wash. Further trials would be needed to ascertain the effect of washing on pesticide residues remaining on other produce or on pesticides with a different mode of action.

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EVALUATION OF THE ANTIMICROBIAL EFFECT OF VEGGIWASH

INTRODUCTION

Foodsafe Ltd produce a range of sanitising solutions for removing microorganisms and other contaminants from the surface of fruit, vegetables, poultry and the hands. Some pilot work has been carried out by Bridle Microbiological Consultants on these products which have showed them to be most effective. The following experimental evaluation was carried out using a protocol developed by Campden & Chorleywood Food Research Association.

Selected vegetables and salad products were inoculated with a range of vegetable pathogens and left to dry. The products were then washed with Veggiwash according to manufacturers instructions and an assay carried out to assess the number of viable bacteria remaining. Comparisons were set up following the same procedure but using chlorinated water (100ppm) and tap water as controls. In order to establish the natural reduction in bacterial numbers over time an untreated contaminated sample was also examined.

EXPERIMENTAL DETAIL

Three commonly found vegetable pathogens were used in the experiment namely, *Escherichia coli*, *Salmonella typhimurium* and *Listeria monocytogenes*. These were grown in broth culture overnight and used to inoculate the surface of the vegetables to a level of approximately 10^6 organisms per gramme of vegetable. The three vegetables used in this series of experiments were Iceberg lettuce, Water Cress and Radish.

Four samples of each vegetable (24 radishes) were infected and left to air dry for two hours before examination. The lettuce was separated into individual leaves and dried initially in a vegetable "centrifuge" for two minutes to remove excess moisture before leaving to air dry.

After two hours one of each of the vegetables (six radishes) were washed in Veggiwash, chlorinated water and tap water, the remainder being left untreated. These were then analysed in triplicate for the presence of each of the bacteria used to infect the vegetables. The unused portions of vegetables were then placed in a refrigerator and stored at 5°C for two days. After 48 hours storage at this temperature the samples were again examined for the presence of the three bacteria. A schematic representation of the experimental protocol is shown below.

EXPERIMENTAL PROCEDURE FOR ANALYSIS OF ONE PRODUCT USING VARIOUS WASHING SYSTEMS

Inoculate 4 samples of lettuce and cress and 24 radishes with a cocktail of *L. monocytogenes*, *Salmonella typhimurium* and *Escherichia coli* and leave to dry for two hours.

Untreated	100ppm Chlorine wash	Tap water wash	Veggiwash (0.5%)
Air dry for 2hrs	Air dry for 2hrs	Air dry for 2hrs	Air dry for 2hrs
Analyse 3 samples	Analyse 3 samples	Analyse 3 samples	Analyse 3 samples
Store @ 5°C for 48hrs	Store @ 5°C for 48hrs	Store @ 5°C for 48hrs	Store @ 5°C for 48hrs
Analyse 3 samples	Analyse 3 samples	Analyse 3 samples	Analyse 3 samples

The results obtained from this experimental protocol are tabulated below. All figure quoted are organisms per gramme of sample.

1 Iceberg lettuce

		Salmonella typhimurium	Listeria monocytogenes	Escherichia coli
Chlorine wash	0hrs	350	480	450
	48hrs	20	40	40
Tap Water	0hrs	4800	3700	5800
	48hrs	3100	2100	3000
Veggiwash	0hrs	210	350	390
	48hrs	<10	30	<10
Control	0hrs	9.8 x 10 ⁴	8.1 x 10 ⁴	1.16 x 10 ⁵
	48hrs	8.2 x 10 ⁴	7.3 x 10 ⁴	8.1 x 10 ⁴

2 Water Cress

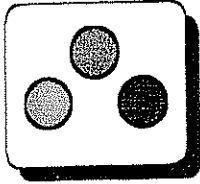
		Salmonella typhimurium	Listeria monocytogenes	Escherichia coli
Chlorine wash	0hrs	1020	680	860
	48hrs	90	40	40
Tap Water	0hrs	7800	5600	14100
	48hrs	5100	3600	9100
Veggiwash	0hrs	880	550	580
	48hrs	30	50	30
Control	0hrs	1.32×10^5	9.3×10^4	2.14×10^5
	48hrs	1.68×10^5	1.04×10^5	2.06×10^5

3 Radish

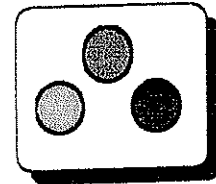
		Salmonella typhimurium	Listeria monocytogenes	Escherichia coli
Chlorine wash	0hrs	320	190	210
	48hrs	<10	<10	<10
Tap Water	0hrs	5800	4800	6300
	48hrs	3100	2000	2200
Veggiwash	0hrs	260	200	180
	48hrs	<10	<10	<10
Control	0hrs	2.88×10^5	1.54×10^5	4.74×10^5
	48hrs	1.31×10^5	8.32×10^4	2.55×10^5

Conclusion

The results show a consistent pattern of reduction of bacterial numbers with a straight cold water wash being quite efficient but still leaving on average some 5% of the initial infection behind after initial wash and 2 - 3% after 48 hours. By contrast the chlorine wash showed a marked reduction with a retention of only 0.7% on the Cress and only 0.1% on the radishes. The **Veggiwash** was consistently the better of the two chemical treatments although the difference between this and a chlorine wash was marginal giving retention of 0.6% on the Cress and 0.09% on the radishes. Both chemical treatments removed the bacteria completely after 48 hours. **Veggiwash** was however much more comfortable to handle and at 0.5% did not give the fumes experienced using chlorine at 100ppm.



Abbott Analytical



Consulting Scientists to the Food Industry

12th March 2001

Certificate of Analysis

Samples: One sample of Fresh Produce Wash received from Foodsafe Ltd., Winwick, Northampton. NN6 7PD. 26th February 2001.

Certificate No: 01B.324.FOO

Page: 1 of 1

Sample Ref: 1b / 324

Analysis Required: Test for microbial reduction on Tomatoes after washing with FPW.
Samples Tested: 6th March 2001

Test protocol.

Fresh Produce Wash (FPW) as received was diluted one part in four hundred in deionised water. One litre of this diluted solution was put in a clean glass bowl. Five Tomatoes were artificially contaminated with *E. coli* and a further five with *Staphylococcus aureus* and allowed to air dry for approximately two hours. One tomato was used as the blank control. This was swabbed with a fresh swab and the swab placed in 10ml of peptone. Two tomatoes for each bacterium were immersed in the Fresh Produce Wash solution and left for two minutes and four minutes respectively with gentle agitation by hand. After this time each was removed and swabbed with a clean swab and the swab placed in 10ml of neutralising solution. Two further tomatoes were treated in the same way but immersing in fresh clean cold tap water. The swabs were then shaken vigorously to disperse the organisms and the number of surviving organisms on each tomato was estimated using standard microbiological plating methods. Plates were incubated for up to 48 hours and the number of bacteria recorded. The results obtained are tabulated below.

	Control	FPW 2 mins	FPW 4 mins	Tap Water 2 mins	Tap Water 4 mins
<i>E. coli</i>	4200	132	0	1170	690
<i>Staphylococcus aureus.</i>	6100	210	0	1050	540

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The journal of
The Pesticides Trust

Worldwide information on pesticides
and their health effects
and their control
in the UK

Quarterly (Volume 1997)

Pesticides News No 35

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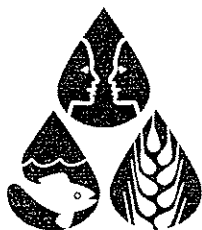
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- US pesticide report
- 1,2-dibromoethane report



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Email: pesttrust@gn.apc.org

<http://www.gn.apc.org/pesticidetrust>



Washing aid for fruit and vegetables

A new product has appeared in UK health food shops that claims to make fruit and vegetables healthier to eat and to improve their storage life. Trevor Nott investigates how effective and useful this product is likely to be.

Veggi Wash works by removing surface pesticide residues, microbial pathogens and other surface contaminants such as atmospheric pollutants, dust and dirt. This is not the first product of its kind on the market, but others have proved to be either too expensive, or not particularly effective. *Veggi Wash* test results show it to be more effective than either chlorine based or water washes. Furthermore it is made purely from vegetable extracts.

Traditionally, retailers use chlorine-based solutions to clean prepared fruit and vegetables, this is both effective and cheap. There are however a number of drawbacks: chlorine can bleach and taint food, and associated fumes can prove uncomfortable for workers. Moreover, chlorine use has a number of undesirable impacts once flushed into the environment. Such problems are not apparent with *Veggi-Wash*, which is altogether more environmentally benign.

Using chlorine is rarely a choice made by the consumer however—it is usually water or nothing. Water can reduce surface pathogens, such as *E. coli*, *Salmonella typhimurium* and *Listeria monocytogenes* by about 95%, and is also effective against atmospheric pollutants. Tests with *Veggi-Wash* have shown that it can reduce pathogen levels by over 99%. This may not represent a significant amount if the product is consumed immediately but it could well delay further build up of pathogen numbers, making the product safer and fresher to eat in the future.

Perhaps of greater benefit to the consumer is the fact that *Veggi-Wash* has proved effective in reducing pesticide residue levels on the surface of food. Concern is mounting, and the public is becoming more aware than ever, of the problems associated with intensive farming practices. The Annual Report of the Working Party on Pesticide Residues 1995, found that 46% of produce tested contained pesticide residues—of these 2% were above the legally permitted maximum residue level (MRL). Furthermore, some produce contained pesticide residues not even approved for use on that crop, either as a result of importing food from countries where the pesticide is approved or by its unauthorised use in this country. Although only 2% exceeded the maximum residue limits (MRLs), they refer to individual residue amounts and therefore take little account of other residues in the same food. Furthermore, experience has shown that pesticide residue levels can vary enormously between individual vegetable plants.

Water has little effect on some residues since they are formulated to resist being easily washed off by rain, tests have showed that anything between 70% and 93.5% of surface

residues remain after washing. Trials conducted by a number of reputable research institutions, have shown that, in some cases, pesticide residue levels can be considerably reduced by using *Veggi-Wash*. For example, tecnazene and chlorpropham levels on potatoes, diphenylamine on apples and quinalphos on broccoli have all been tested (see box).

That *Veggi-Wash* is effective against surface pesticide residues appears to be in little doubt, but it raises a number of questions. *Veggi-Wash* cannot reduce systemic pesticide residue within the flesh of fruit and vegetables

Response to the product

The organic vegetable lobby is wary of the product. *Veggi-Wash* is no miracle cure—it certainly does not make fruit and vegetables suddenly organic. It has been shown to be effective on a number of common pesticide residues, reducing amounts but certainly not eradicating them. *Veggi-Wash* has been described by one organisation as a 'band aid'—why create a partial solution for a problem that could be avoided in the first place? As for cleaning surface contaminants such as bacteria and atmospheric grime, vinegar or lemon is considered a reasonable solution.

The truth is that in an ideal world, organic, locally grown fruit and vegetables would be available. Although the situation is gradually changing, organic produce can be difficult to find, and is usually more expensive. Consumers are often not in the position to make a choice and therefore a product such as *Veggi-Wash* could be of benefit to them, whilst at

How does it work?

Veggi Wash contains three naturally based surface active ingredients that have different functions. The first works on the surface of vegetables reducing the surface tension of the water to help dislodge any form of contaminates or environmental pollution. The second encapsulates these particles and holds them in solution. The third starts to break down the deposits and aids final rinsing. All the ingredients are derived from vegetables.

Pesticide residue results: *Veggi-Wash* was tested on a number of pesticide residues namely: diphenylamine on apples, chlorpropham, tecnazene and 2,3,5,6 tetrachloranille on potatoes, dithiocarbamate on lettuce and quinalphos on broccoli. Water has little effect on these residues since they are formulated to resist being easily washed off; various tests showed that anything between 70% and 93.5% of surface residues remain after washing. *Veggi-Wash* performed somewhat better, reducing tecnazene levels on potatoes by between 12.9% and 45.7% (compared with a 4.3% reduction for water), chlorpropham on potatoes by 93.4% (6.7% reduction for washing in water), 2,3,5,6 tetrachloranille on potatoes by 95% (water not compared), diphenylamine on apples by 93.4% (water 30%), quinalphos on broccoli by between 23% and 25% (water 6.7%).

the same time raising public awareness surrounding the whole pesticide residue debate.

The major supermarkets are not currently stocking the product. They point out that pesticide residues on food are within safe limits, and all other contaminants can be washed off with water. However by stocking *Veggi-Wash* they would draw attention to the pesticide residue issue and consumers could well question the safety of the food they have been purchasing.

Trevor Nott works at the Pesticides Trust.

Australian residue concern

The Australian New Zealand Food Authority has released results of the 1994 Australian Market Basket Survey, which researches pesticide residues in a range of food stuff. It concluded that Australian food contained very low levels of pesticide residues. However, only 17 of 77 foodstuffs were free of pesticides and Henry Osiecki, a Queensland nutritionist believes the results are frightening. He said the assessments ignored the cumulative effects of chemicals. For example, the 13 chemicals found in apples represented five different groups of pesticides, Mr Osiecki said.

In all, 60 foods yield low levels of pesticides, although some contained only one or two chemicals. Those food groups which contained multi-pesticide residues were apples (13), beans (8), capsicums (15), carrots (8), celery (11), white bread (6), and wholemeal bread (8).

The Sunday Mail (Australia) 12/1/97.

Residues above the MRL in stated foods

endosulfan (lettuce)
chlorpyrifos (beans, capsicum, grapes, pumpkin, permethrin, cheese)

Unauthorised chemicals detected

chlorpyrifos (celery, canola oil, smoked fish, kangaroo meat)
dicloran (wholemeal bread, smoked fish, margarine)
dicofol (peperoni)
dieldrin (pumpkins)
diphenylamine (lettuce, beans, capsicum)
ethion (wholemeal bread)
fentitrothion (canola oil)
fenthion (extruded snack food)
lprodione (capsicum, avocados)



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14 October 1994

Dear Mr Green

VEGGI-WASH

Thank you for your two faxes dated 27 July which contained various information about this product. I apologise for the delay in replying, but this is an unusual case and I have consulted various Divisions within MAFF to determine how the existing law applies. I should, however, point out that our opinion has no legal force since responsibility for the interpretation of UK legislation lies with the enforcement authorities and ultimately with the courts.

On the basis of the information you have provided and on the assumption that you can verify that the inevitable residues left on and consumed with the produce treated with Veggi-Wash do not have an additive effect, it seems that Veggi-Wash can be classified as a processing aid. Under the Food Safety Act 1990, processing aids fall within the definition of "food"¹ and therefore all relevant sections of the Act would apply. Accordingly, the product should comply with food safety requirements, be of the nature, substance and quality demanded and not be falsely described or presented².

Finally, I note that the proposed label refers to "UK approvals". I would suggest that this statement be removed, since there is no approval system for such a product. I suppose you might say "complies with relevant UK legislation" - but then again you are effectively saying that just by offering it for sale.

I hope these explanations are clear. Please contact me again if you need anything further.

Dr C A LAWRIE
Food Science Division

