

# Fresh

PRODUCE WASH



A chlorine-free wash for all your Salad Ingredients

**Fresh**  
PRODUCE WASH

# Safe salads healthy living

By using Fresh Produce Wash on all your fruit, salad and vegetables you will help protect consumers from food poisoning caused by pathogenic bacteria, such as E. coli, Listeria and Salmonella.

## Fresh Produce Wash:

- Kills over 99% of Bacteria
- Odourless & Taste-Free
- No Need to Rinse
- Safe to Eat
- Classified as Non-Hazardous under EU Regulations



Chlorine Free  
**WASH**  
for Salad, Fruit  
and Vegetables!

Make your produce safe today!



For a FREE sample please  
call 013 84 550 556 or  
E-mail: [enquiries@drywite.co.uk](mailto:enquiries@drywite.co.uk)

[drywite.co.uk](http://drywite.co.uk)

# Why Fresh Produce Wash?

Fresh Produce Wash has been specially developed with the consumers in mind. High profile scares in the press about bacteria in chickens and pesticides on vegetables are common place.

It is no wonder the pesticides and fertilisers used to grow most of our foods build up on vegetables, some are specifically formulated not to wash off in the rain! It therefore stands to reason that tap water probably will not wash them off either.

Even organically grown produce can harbour dirt and bacteria, and is exposed to exhaust fumes and other toxins during transport. Any number of people will have handled your fruit and vegetables before they reach the customer.

Now Drywite, who have over 85 years experience in vegetable preparations, has the solution with Fresh Produce Wash.



# About Fresh Produce Wash

All fruit and vegetables when harvested have a certain amount of surface soiling, microbiological contamination including E-Coli and Listeria and pesticide residue. Fresh Produce Wash is an ideal solution for the effective washing of fruit and vegetables because of its unique combination of ingredients and has strong surfactant, antibacterial and stomatal washing properties. The product has also been formulated with good wetting, emulsifying and dispersing properties making it effective in removing pesticide residues.

Fresh Produce Wash has good anti-foaming properties which make it suitable for all types of machine and manual washing operations. Dilution rate is 200 to 1 and dip times are typically 2 to 5 minutes.



Fresh Produce Wash was developed at the request of the processing industry because of its concerns about chlorine. In Europe additional chlorine must be washed off because of the danger.

Fresh Produce Wash has been developed to achieve the following objectives:-

- To be an effective fruit and vegetable wash, capable of removing physical soiling and pesticide residues
- To act as a Non biocidal agent capable of reducing bacterial numbers to improve product quality and reduce microbiological spoilage
- To be environmentally responsible

Fresh Produce Wash is a formulation of environmentally friendly bio-degradable substances with low taste and odour profiles, which do not alter in any way the characteristic taste and odour of the products on which it is used.

All the ingredients are food grade, GMO free, organic, of plant origin and renewable sources. They also fall within the FDA. Generally recognised as "safe" or "GRAS" regulation CFR title 21. Fresh Produce Wash is confirmed by the trading standards as a processing aid as described in 89/107/EEC Article 1.3(a), the formulation is based on sucrose esters, sodium citrate and glycerine.

# About Fresh Produce Wash

## continued

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- Specifically formulated to kill pathogenic bacteria including Salmonella Typhimurium, Listeria Monocytogenes, Campylobacter Jejuni, E-Coli, and Staphylococcus Aureus. Which are the major causes of food poisoning.
- Kills spoilage bacteria, the major cause of vegetables deteriorating and discolouring, therefore, vegetables last longer too!
- Removes soil residues, pesticides and fertilisers.
- Tasteless and odour free.
- Cost effective. One measure of Fresh Produce Wash mixed with water can wash over 100kg of vegetables, with the solution being used throughout the day.
- Reduces vegetable waste.
- GMO free, with all ingredients being of food grade quality, of plant origin and from self-sustaining crops.
- Fresh Produce Wash is covered by the Miscellaneous Food Additive Regulations, as a processing aid.
- **Classified as non-hazardous** under COSHH regulations. Directive 67/548/EEC or its amendments.
- FDA-CFR (Title 21) 'GRAS' STATUS.
- Chlorine free and totally biodegradable.
- Independently tested for its effectiveness of reducing bacteria and pesticides. The results have been startling not only for harmful pathogenic organisms such as salmonella and pesticides, but also for spoilage organisms. So not only will your customers be eating a healthier product, but if the salads or vegetables after washing are stored appropriately, they should last longer too.

# Why do you need Fresh Produce Wash?

Drywite Limited is experienced in this aspect of processing and can offer expert guidance. Fresh Produce Wash is suitable for use in the mechanical washing operations or manual washing operations if appropriate.

The presence of pesticide residues on the surface of freshly harvested produce is an issue of growing concern in the mind of the consumer, and quite rightly so. Pesticides are designed to adhere to the surface of vegetables thus ensuring continued plant protection, even after heavy rainfall. It automatically follows therefore, that unless the washing agent is specifically designed to remove compounds of this kind, then the residues will remain on the vegetables at the point of sale to the consumer.

Fresh Produce Wash has been specifically formulated with the wetting, emulsifying and dispersing properties to effectively remove pesticide residues. Drywite Limited have conducted exhaustive tests using independent laboratories on a wide range of vegetables which scientifically validates this claim.

These principles apply to industrial applications and to smaller daily washing in the food preparation environment.

# Laboratory Results



# How Effective is Fresh Produce Wash?

Independent laboratory tests on a wide range of fruit and vegetables have shown the effectiveness of Fresh Produce Wash, the following are some of the results obtained.

## Drywite Fresh Produce Wash (FPW)

Results on fresh lettuce. Dip time 2 minutes	TVC (cfu/g)
Control sample, tested before dipping	1.2 x 10 <sup>3</sup>
Treated in FRESH PRODUCE WASH	130
Control sample tested 2 hours later	1.3 x 10 <sup>3</sup>

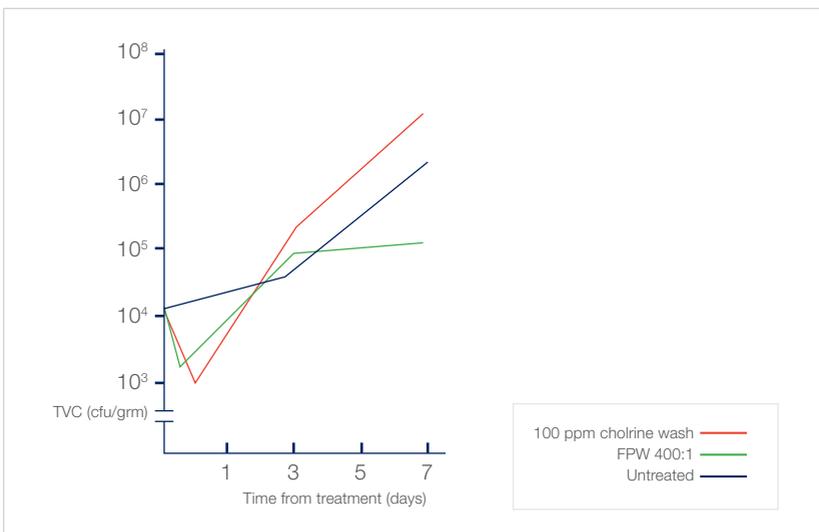
*Free range and intensive production hens' eggs were purchased from a supermarket and gently agitated in Fresh Produce Wash @ 200:1 for three minutes. TVC and total coliforms in cfu/g were estimated using methods based on BS5763.*

		Control	Cold Water Wash	Fresh Produce Wash	
				400:1	200:1
Free Range	TVC	9120	4160	1720	710
	Coliforms	130	90	<10	<10
Intensive Production	TVC	3720	2040	780	210
	Coliforms	20	<10	<10	<10

# How Effective is Fresh Produce Wash? continued

Results of fresh lettuce leaves washed in Chlorine @ 100ppm and Fresh Produce Wash stored at between 2 and 6°C.

	TVC (cfu/gm)		
	UNTREATED	Chlorine wash at 100ppm	FPW
Day 0	$3.8 \times 10^4$	$3.2 \times 10^3$	$3.6 \times 10^3$
Day 3	$1.5 \times 10^5$	$3.5 \times 10^5$	$3.0 \times 10^5$
Day 7	$6.5 \times 10^6$	$1.5 \times 10^7$	$7.4 \times 10^5$



A challenge test was carried out using three different dilutions of Fresh Produce Wash on microbes found on vegetables and included to cover Public Health considerations.

Micro-organism	cfu/ml inoculated into test materials	Recovery counts cfu/ml			Average %
		100:1	200:1	400:1	
Staphylococcus aureus	$3.7 \times 10^8$	20	<10	<10	>99.99
E-coli	$1.6 \times 10^9$	<10	<10	<10	>99.99
Saccharomyces cerevisiae	$2.0 \times 10^8$	10	10	70	>99.99
Aspergillus niger	$2.5 \times 10^8$	$2.0 \times 10^4$	$1.7 \times 10^4$	$1.5 \times 10^4$	99.99
Bacillus subtilis	$2.3 \times 10^7$	$7.0 \times 10^4$	$3.8 \times 10^4$	$3.8 \times 10^4$	>99.99
Pseudomonas chloroaphis	$1.1 \times 10^9$	<10	<10	<10	>99.99
Enterobacter amnigenus	$7.4 \times 10^8$	<10	<10	<10	>99.99
Salmonella typhimurium	$6.6 \times 10^9$	75	35	40	>99.99
Listeria monocytogenes	$7.2 \times 10^8$	<10	10	<10	>99.99
Campylobacter jejuni	$3.7 \times 10^3$	0	0	0	100.00
Mycobacterium smegmatis	$3.1 \times 10^6$	Not carried out	Not carried out	9.800	99.68
Shigella Sonnei	$3.4 \times 10^3$	Not carried out	Not carried out	15	>99.99

These results show a dramatic reduction for all bacteria tested. Pathogenic organisms Staphylococcus aureus, E-coli, Salmonella typhimurium, Listeria monocytogenes and Campylobacter jejuni are reduced to a level which effectively eliminates Public Health considerations. Spoilage bacteria are reduced to a level which will retard the natural process of deterioration associated with fresh produce.

# How Effective is Fresh Produce Wash? continued

## Drywite Fresh Produce Wash (FPW)

### INGREDIENT RESIDUES

Iceberg lettuce was washed in Fresh Produce Wash for 3 minutes, then spun to remove excess liquid. It was then analysed for the component parts of Fresh Produce Wash by suitable methods, as described in Pearson's Chemical Analysis on foods. The results of four tests were aggregated and tabulated as below:

*Tests conducted 20.8.1999*

Ingredient	Analytical method used	Mean result $\mu\text{g/g}$
Sucrose Esters	HPLC	3.1
Sodium Citrate	GLC	5.2
Glycerine	GLC	2.3

*Tests conducted 24.10.2000*

Ingredient	Analytical method used	Mean result $\mu\text{g/g}$
Sucrose Esters	HPLC	2.8
Sodium Citrate	GLC	4.6
Glycerine	GLC	3.5

Various items were washed in Fresh Produce Wash in an agitated washer for three minutes. In process conditions the following results were obtained.

	TVC cfu/g	
	Before Treatment	After Treatment
Chef's Salad	$3.0 \times 10^6$	$4.6 \times 10^4$
Mixed leaf salad	$4.7 \times 10^5$	$4.0 \times 10^3$
Carrots	$7.2 \times 10^5$	$6.0 \times 10^2$
Onions	$1.3 \times 10^5$	$1.2 \times 10^4$
Broccoli	$6.6 \times 10^5$	$21 \times 10^4$

Two types of mushroom were tested; small button ones and the much larger open 'breakfast' mushrooms. The mushrooms were purchased from a supermarket. They were washed in Fresh Produce Wash at 400:1 and at 200:1 for 3 minutes with the results as follows.

		Before Treatment	FPW @ 400:1	FPW @ 200:1
Button mushrooms	TVC	$6.39 \times 10^6$	$7.02 \times 10^4$	$1.44 \times 10^4$
	Coliforms	$2.43 \times 10^5$	$7.0 \times 10^2$	<100
Breakfast mushrooms	TVC	$4.24 \times 10^5$	$5.02 \times 10^3$	$7.8 \times 10^5$
	Coliforms	$5.92 \times 10^4$	$3.0 \times 10^2$	<100

## How Effective is Fresh Produce Wash? continued

Carrots and Onions were washed in Fresh Produce Wash @ 400 to 1, chlorine @ 150ppm and a competitive product @ 200 to 1. All units in cfu/g.

		FPW	Chlorine	Competitive product
Carrots	Coliforms	<10	$8.5 \times 10^3$	$2 \times 10^3$
Production	E.Coli	<10	<10	<10
Production	Coliforms	220	$1.2 \times 10^5$	$1.3 \times 10^4$
+3 days	E.Coli	<10	<10	<10
Onions	Coliforms	50	290	210
Production	E.Coli	<10	<10	<10
Production	Coliforms	370	$1.9 \times 10^5$	$7.4 \times 10^4$
+3 days	E.Coli	<10	<10	<10

## Fresh Produce Wash and Pesticide Residues

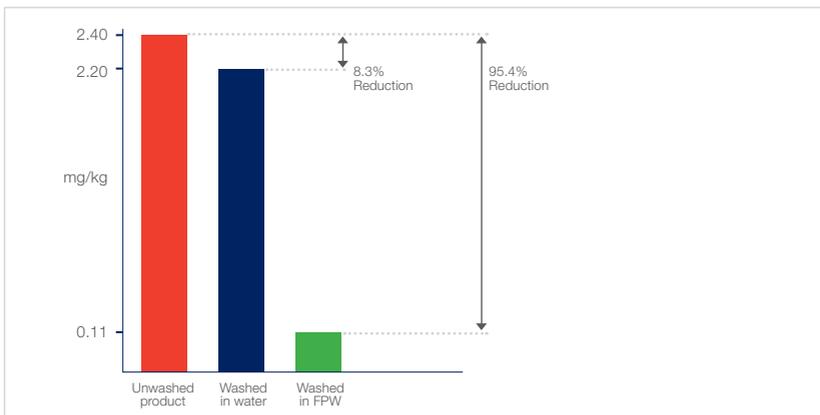
Water has little effect on some surface residues because they are formulated so as not to be washed off by rain or during watering.

Fresh Produce Wash is effective in removing pesticide residues as well as surface contaminants, atmospheric grime and bacteria.

Fresh Produce Wash, when tested on a number of pesticide residues on potatoes, resulted in Techazene levels reducing by up to 45% (compared with 5% for water alone), Chlorpropham was reduced by 95% (8% with water alone) and Tetrachloranille was reduced by 95%.

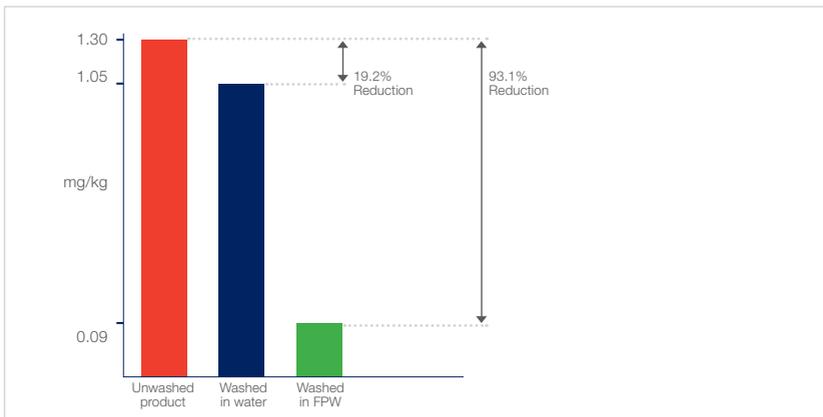
On apples, Diphenylamine was reduced by 93% (compared to 20% for water alone), Quinalphos on broccoli was reduced by up to 25% (compared to 7% for water alone).

The following are the results obtained from washing potatoes treated with Chlorpropham in water and Fresh Produce Wash.

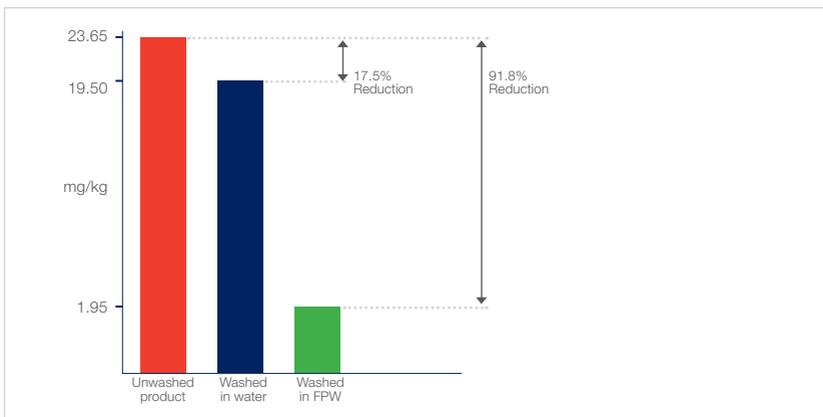


# How Effective is Fresh Produce Wash? continued

The following are the results obtained from washing apples treated with Diphenylamine in water and Fresh Produce Wash.



The following are the results obtained from washing lettuce treated with Dithiocarbamate in water and Fresh Produce Wash.



How Fresh Produce Wash fits into the fruit and vegetable washing process.

The most commonly used washing sanitiser for fruit and vegetables is chlorine. Over 75% of those involved in this operation use chlorine.

A firmly established industrial standard of chlorine concentration is 100 parts per million [ppm]. However over half of those that use chlorine use it above concentration. In fact, a substantial number of operators use it at over 250 ppm.

[Facts obtained from C.C.F.R.A. Review of Current industry Practice on Fruit and Vegetable decontamination.]

The following are comparisons between chlorine and Fresh Produce Wash:

<b>Odour</b>	Chlorine has a strong pungent odour that can be sensitising and an irritant to the mucus membrane, producing unpleasant working conditions. <b>Fresh Product Wash is inert and odour free.</b>
<b>Corrosion</b>	Chlorine is corrosive, causing problems with process equipment. It can affect metal components within the building, including structural supports. <b>Fresh Product Wash is non-corrosive.</b>
<b>Bleach</b>	Chlorine acts as a bleach with certain fruits and vegetables, causing a colour change. <b>Fresh Product Wash does not bleach.</b>
<b>Taste</b>	Chlorine can be tasted after certain concentration and exposure times, also causing flavour modification. <b>Fresh Product Wash does not taste or affect flavour.</b>
<b>Nutrition</b>	Chlorine can alter the nutritive and organoleptic qualities of fruit and vegetables. <b>Fresh Product Wash does not alter these qualities.</b>
<b>Disposal</b>	Chlorine in waste water can become toxic to fish and other aquatic organisms. <b>Fresh Product Wash can be disposed of safely into the environment.</b>

# Where does Fresh Produce Wash fit in?

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## Usage

Chlorine is a good biocide but is only effective within a narrow pH range. **Fresh Product Wash is effective over a much wider pH range.**

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## Usage

Chlorine evaporates very quickly as water temperature rises and so becomes less effective. **Fresh Product Wash is unaffected.**

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## Usage

Chlorine is harmful to the skin, must be kept in a cool area away from other chemicals to avoid forming chlorine gas. As a raw material it is hazardous. **Fresh Product Wash is safe in use, storage and is non-reactive.**

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## Manufacture

Manufactured Chlorine is not made using natural or naturally derived raw materials which are renewable. **Fresh Product Wash is made entirely from natural, renewable raw materials. It is fully digestible and readily biodegradable.**

**Fresh**  
PRODUCE WASH

# Safe salads healthy living

By using Fresh Produce Wash on all your fruit, salad and vegetables you will help protect common food-borne poisoning caused by pathogenic bacteria, such as E. coli, Listeria and Salmonella.

## Fresh Produce Wash:

- ✔ Kills over 99% of Bacteria
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