



FRESHNESS

EXTENSION TECHNOLOGY

Maintaining quality and shelf life in fresh cut fruits and vegetables

The Challenge.

Cutting, peeling and slicing fresh produce throws up a number of challenges to shelf life including wounding reactions which lead to discoloration and browning, loss of structural integrity, accelerated water loss, softening, mechanical shocks leading to cracks and bruises.

Enzymes, called Polyphenol oxidases (PPO), initiate these browning reactions.

Various methods can be deployed to reduce the impact of browning. The most important of these include temperature management, the exclusion of oxygen and the use of dips to control browning and maintain texture of cut surfaces.

NatureSeal® products are widely used to maintain quality and extend shelf life.

Features and benefits.

- Proprietary powder blends of vitamins and minerals
- Used as processing aids to maintain colour (prevent enzymatic browning).
- Maintains texture – reduces moisture loss and softening.
- Does not impart flavour, colour, odour or taste.
- Developed with USDA and conform to UK and EU Food Law.
- Free from allergens and sulphites.
- Certain formulations permitted in organic production.
- Kosher and Halal
- Custom blends for different fruits and vegetables.

NatureSeal is applied by a simple dipping or fluming process. Produce needs to be dipped as soon as possible after cutting. NatureSeal will effectively control browning in fruits such as apples and pears and in vegetables such potatoes and parsnip.



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NatureSeal for apples & pears



NatureSeal will provide up to 21 days shelf life in fresh cut apple and pears; preventing browning and maintaining crispness without impacting on flavour and odour. Conventional and organic formulations are available.

NatureSeal for stonefruit



NatureSeal formulations are available to maintain shelf life in prepared nectarines, plums and peaches.

NatureSeal for avocados and guacamole



NatureSeal will maintain colour and shelf life in prepared avocados (dices, slices, chunks) typically offering up to 5 -6 days shelf life. Ideal for avocado inclusions in salads, sandwich fillings, sushi etc. Alternative formulations are available for guacamole.

NatureSeal for banana



NatureSeal maintains colour in fresh cut banana for up to 4 -5 days.

Carrots, coins, sticks and shreds



NatureSeal will maintain colour, reduce whitening and silvering, and helps to control bending and cracking in carrot sticks. NatureSeal prevents carrots drying out.

Potatoes and other root crops



NatureSeal can eliminate the use of sulphites and will maintain fresh appearance and colour in potatoes and other root crops such as parsnip, . Colour is maintained in other root crops such as sweet potatoes, swede

NatureSeal for mango, kiwi fruits, pineapples, melons and persimmon



NatureSeal helps to reduce purge, translucency and breakdown; maintaining the brightness of the cut fruits.

NatureSeal FS (product wash), developed to replace chlorine, available for fruit, vegetables and salads.

| Fruit | NatureSeal Formulae | Shelf life/days |
|--------------------------|----------------------|-----------------|
| Apple - Dessert | NatureSeal AS1 & AS5 | 7-12 days |
| Apple - Culinary | NatureSeal AS7 & AS5 | 7-12 days |
| Banana | NatureSeal BA1 | 6-7 days |
| Pear | NatureSeal AS1 | 7-12 days |
| Pineapple | NatureSeal AS1 | 7-12 days |
| Carambola (Star Fruit) | NatureSeal AS2 | 7-12 days |
| Mango | NatureSeal MG2 | 7-12 days |
| Rhubarb | NatureSeal AS5 | 7-12 days |
| Lime | NatureSeal AS1 | 7-12 days |
| Nectarine, Peach | NatureSeal NEC1 | 7-12 days |
| Plum | NatureSeal AS1 | 7-12 days |
| Persimmon (Sharon Fruit) | NatureSeal AS1 | 7-12 days |
| Avocado | Natureseal BAS &GU7 | 6-7 days |
| Kiwi | NatureSeal AS1 | 7-12 days |

| Vegetables | NatureSeal Formulae | Shelf life/days |
|---------------------|---------------------|-----------------|
| Carrot | NatureSeal AS5 | 7-12 days |
| Leeks | NatureSeal AS5 | 7-12 days |
| Runner Beans | NatureSeal AS5 | 6-7 days |
| Cauliflower/Sprouts | Natureseal AS5 | 6-7 days |
| Endive (Chicory) | NatureSeal BE1 | 6-7 days |
| Butternut Squash | NatureSeal PS10 | 7-12 days |
| Parsnip | NatureSeal PS10 | 7-12 days |
| Potato | NatureSeal PS10 | 7-12 days |
| Pumpkin | NatureSeal PS10 | 7-12 days |
| Celery | NatureSeal AS5 | 7-12 days |
| Sweet Potato | NatureSeal PS10 | 7-12 days |
| Beetroot | NatureSeal ONC3 | 7-12 days |
| Aubergine | NatureSeal AS5 | 6-7 days |
| Broccoli | NatureSeal AS5 | 6-7 days |