



From peel to profit: Turning Onion waste into wealth

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Abstract

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Onion: waste to health inspects the nutritional and health potential benefits of onion waste parts (peels, outer layers, and root ends) that are usually discarded or thrown. These waste portions have concentrated antioxidants, specifically quercetin, along with fiber, vitamins, and minerals. There is a demonstration of how onion waste can be reused for health and other applications such as tea preparation from peel, vegetable soup, natural dyes from outer layer, hair enriching products, composting & skincare. By reusing these waste parts of onion, we can reduce environmental waste while increasing nutritional and economic benefits also make this vegetable a boon for life.

Keywords: Onion, quercetin, composting, boon

Introduction

Onion is one of the universally used vegetables in cookroom around the society. It is found in nearly every dish; the bulb adds flavour and nutrition to every dish. However, most people throw away important portions of the onion - mainly the outer layers, peels, and root ends which are considered as waste. Onion waste may have potential applications in agricultural, industrial, nutraceutical, and cosmetic sectors (Celano *et al.*, 2021). They don't understand is that these waste parts hold valuable nutrients and health-promoting compounds which can be useful for the society if used wisely. For example, as a functional food ingredient, onion waste can be turned into useful by-products with good antioxidant properties (Roldán *et al.*, 2008). The aim of "waste to health" with onions explains how we can utilize every part of this majorly grown vegetable for better health and reduced waste.

Nutritional worth of Onions

Onions are generally a packhouse of useful vitamins and minerals in it. They contain or are rich in Vitamin C, that helps to improve immune function and skin health. B-complex vitamins, mainly B6 and folate, are present in adequate amounts which helps with metabolism and cell function positively. The potassium content present in onion regulates blood pressure, and manganese improves bone health.

Apart from basic nutrients, onions exhibit powerful antioxidants too. The most useful is quercetin, a flavonoid present in the outer layers and skin of the onion that fight against oxidative

stress. Quercetin contains anti-inflammatory and antihistamine properties. Onions also has sulphur compounds that give them their pungent smell. The fiber content in onions, particularly a type which is known as inulin, performs as a prebiotic and supports digestive health.

Major Health assets of Onion

Digestive Health Benefits: The fiber and prebiotics present in onions feed beneficial gut bacteria in human body, giving a healthy digestive system. This mainly improves digestion, reduce constipation, and improves overall gut health, which is being considered as central to whole-body wellness.

Blood Glucose Regulation: research says that onions may help to improve or regulate blood sugar levels. Specific compounds in onions can improve insulin sensitivity and help to manage diabetes wisely. The chromium content also plays a crucial role in blood sugar control.

Cancer Prevention: The sulphur compounds and antioxidants in onions may have cancer-opposing properties. Daily onion consumption has been associated with reduced risk of several types of cancer, including stomach, colorectal, and prostate cancers.

Wasted Parts of Onion & their Potential

Mostly people peel away the outer layers of onions and throw them without rethinking for a second. Same as with, the root ends and usually the first one or two fleshy layers often end up as useless and are discarded. This is regrettable

because these parts are actually the most nutrient-rich portions of the onion about which the society has to be aware of **Onion Peels**: The dry, papery skins of onion have the highest amount of quercetin and other antioxidants - up to 10-15 times rich or more than the flesh. They are also rich in fiber and contain natural antimicrobial compounds within it.

Outer Layers (mostly discarded): The first few fleshy layers that we usually remove because they are a bit damaged or dried contain respectively more nutrients than the inner portions. The deeper is the colour of layers, higher is the antioxidant content in it.

Root Ends: These are woody in nature; these parts contain concentrated nutrients in it and can be used in various preparations where texture is not important or the major requirement.

How to make these waste parts a boon for society?

Onion Peel into Tea: Primarily clean the peels completely and boil them in water for 15-20 minutes. This helps to make a nutrient-rich tea that will help with inflammation, immune support, and also for sleep cycle. The tea contains a mild flavour & slightly sweet.

Vegetable Soup: Preserve all onion waste parts such as peels, root ends, and outer layers in a freezer bag. When you have these discarded items enough, mix them with other vegetable wastes to make a tasty, nutritious homemade soup. This soup is rich in minerals and antioxidants.

Homemade Dye or Natural Dye: Onion skins, mainly red onion skins, gives attractive natural dyes ranging from yellow to deep orange and reddish-brown. These can be used to colour fabrics and totally chemical free.

Useful Hair Care: Just boil onion peels and use it for washing hair it and may promote hair growth. The high antioxidant availability nourishes the scalp.

Composting Benefits: use onion waste parts directly either they make excellent compost material. They have the ability to break down relatively quickly and add nutrients back to the soil.

Face Masks or Cleanser: Dry onion peels at ground and mix it with other ingredients to make face masks that may help with skin tone and texture because of their antioxidant properties.

Table 1. Environmental and Economy effect by using onion waste

Elements	Including Waste Parts	Excluding Waste Parts	Advantages or Benefits
Kitchen Waste	5-10% wasted	20-30 % wasted	20-25 % reduction
Money Generated	55- 100/month	0	Cost saved on tea and remedies
Nutrients Used	95-98 % utilized	65-70 % utilized	Better nutrition
Carbon trace	Less waste	More Waste	Environmental Benefit

Conclusion:

The passage from "waste to health" with onions says that nature wastes nothing - we simply need to learn how to use what we have, more wisely and concisely. Likewise, every part of the onion, from the innermost layers to the outermost skin, provides nutritional and health benefits. By focusing on what we consider as waste parts are not really useless, we can utilize it and bring out benefits and also reduce environmental impact, generate income and improve our health at the same time.

References:

- Celano, R., Docimo, T., Piccinelli, A.L., Gazzero, P., Tucci, M., Di Sanzo, R., Carabetta, S., Campone, L., Russo, M., & Rastrelli, L. (2021). Onion peel: Turning a food waste into a resource. *Antioxidants*, 10(2), 304.
- Roldán, E., Sanchez-Moreno, C., de Ancos, B., & Cano, M. P. (2008). Characterisation of onion (*Allium cepa* L.) by-products as food ingredients with antioxidant and antibrowning properties. *Food chemistry*, 108(3), 907-916.