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ACET Research on Food Waste Management

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Journal Article

This article is a global perspective on fruit and vegetable waste with some very valuable statistics to outline the problem. I have extracted some facts below that stood out to me: I think it is important to also have academic sources on the website even though they may be very specific to the global issue.

<https://onlinelibrary.wiley.com/doi/10.1111/1541-4337.12330>

- An estimated 1.3 billion tons of food waste produced per year, approximately one third of the total food produce
- Estimation for food waste in 2008 of \$42.8 billion USD or \$141 per person
- Waste produced by fruit and vegetables consist of 60% of total food waste, 30% of which is from the by-products (such as trimmings and leaves ect.) United nations Food and Agriculture Organization (FAO)
- In recent years, fruit production has increased very significantly to keep up with the demand of the growing population. As a consequence, so has the fruit waste (2)
- Largest potential for improvement (LaCanne & Lundgren, 2018) in food waste is the areas of the world where demand for food supply is low
- The waste is not only associated with the direct loss of fruit, but the associated loss of critical resources such as land, water, fertilizers, and labor.
- This waste contains valuable sources of nutrients, fibers, oils and other components that can be useful across various industries such as pharmaceuticals, textile, food and agriculture.
- The use of fruit waste for production of various goods is an environmentally sustainable solution to using resources that would otherwise end up in landfill
- Various reasons that there is food waste is due to cultural perceptions of what healthy fruit should looks like.
- Also, there is usually an over-supply of fruit and vegetables to compensate for busy days at the markets or wholesalers
- A lack of handling methods and waste processing infrastructure
- Estimates 1/3 of fruit waste is lost post-harvest, and does not reach the consumer
- ** The immense amount of waste contributes to climate change as they decompose in landfills and emit greenhouse gasses
- Reduction of waste can increase profit
- Although some waste is unavoidable, the proper use of waste can be beneficial to the aforementioned industries. An increased demand for fruit waste can also establish an initiative for sustainable development in regards to fruit waste

- Losses occur throughout the supply chain from pre to post harvest due to the way “production and supply chains function within their legal framework”
- Food lost waste is high in both developed and developing nations but in different parts of the supply chain: usually, losses are high in the supply chain due to technological limitations in developing nations such as handling, refrigeration etc. whereas in developed nations food waste tends to be through negligence and a consumer’s conscious choice to throw away fruit**

German Fruit Waste Start up Video

<https://www.youtube.com/watch?v=agp5otp8bWA>

This is based on a German start up using fruit waste to produce long lasting fruit chips using ugly fruit and fruit waste. Here are some key facts from the video:

- 20 % of all fruit are wasted directly from the farm (1)
- Fruits being thrown away at the wholesalers due to optical defects
- No added preservatives or ingredients to

Alternate Fruit Waste Uses

These are some possible alternatives for the applications of fruit waste. I have attached some examples of these below:

- Aromas, antioxidants, natural colorants and dietary supplements (4)
- Certain types of fruit can be used to make a bio digester to produce bio-gas
- Source of fiber for supplements and textiles
- For the removal of heavy metals and dyes from wastewater.
- For processing into bricks used in boilers or domestic fireplaces.
- As a growth substrate for the cultivation of fungi and bacteria. These organisms can produce value-added products during growth such as enzymes used in the production of biofuel or fine chemicals.
- As a source of organic acids typically used in food, natural biocontrol agents such as natural pesticides, and bioplastics for the manufacture of bio-degradable containers.
- Biomass can also be used for growing edible mushrooms, micro-algal growth for biofuel production and fungal/bacterial biomass for composting or biofuel.

Companies in Australia Using Fruit Waste for Products

Here are some companies in Australia that are using fruit waste to produce what they are selling In Australia. They vary from frozen fruit to creating supplements and using ‘ugly fruit’ for food production. I have attached a few links below:

- <http://www.totallypurefruits.com.au>
- <https://www.freezedryindustries.com.au>
- <https://sunlifesuperfoods.com.au/our-story/>
- <https://www.harrisfarm.com.au/blogs/campaigns/imperfect-picks>

Online Survey Created

I have created an online survey that can be used to gauge fruit waste in certain areas of Australia and more information could be used on areas that need more attention in terms of improving fruit waste as a problem. Feel free to let me know if you would like access to the survey or like me to make changes via email.

<https://docs.google.com/forms/d/1Xufau--x5mQt127160Twc2VWNvS4jeDGjDvM3joy3GE/edit>

Food Processing Waste Improvement

This document is a short, dense and valuable document for educational purposes that should be used for the page. It shows fruit production and processing facilities the cost benefits of reducing waste in their factories and the payback period. Financial incentive is always a good motivation for change in businesses.

https://cdn.aigroup.com.au/Environment/20_Food_Processing_FruitVegetable_Waste_Reduction_Factsheet.pdf

American Large-Scale Fertilizer Company

This is a video from an American news channel reporting on an American company that is manufacturing large amounts of organic fertilizer using predominantly fruit waste. Given the technology that ACET has and intends to use, this is a good video to have.

<https://www.youtube.com/watch?v=agp5otp8bWA>

International and Australian Fruit Waste Facts – OzHarvest

This website is from an organisation dedicated to targeting fruit waste through donations and an educational campaign. They have very useful facts on the page that you can extract to put on the ACET website. Also very valuable sources on the bottom of the page linked below to credible academic and credible sources of information.

<https://www.ozharvest.org/what-we-do/environment-facts/>

Waste Less, Recycle More - Document from NSW Government

This document is from an educational program from the EPA in NSW targeting food waste in urban residential areas. It talks about how to better manage waste and the benefits of managing waste properly. Also contains some valuable videos.

https://cdn.aigroup.com.au/Environment/20_Food_Processing_FruitVegetable_Waste_Reduction_Factsheet.pdf

Fruit is Wasted Podcast

This podcast talks about fruit with a woman from Denmark who has been a key leader in pushing for more sustainable fruit waste practices in her country. She has had a lot of success over the years through government policies and educational campaigns. Would highly recommend putting this on the page too.

<https://podcasts.apple.com/au/podcast/selina-juul-denmarks-food-waste-champion/id1108391990?i=1000416109652>