

## case study

# *Proactive Waste Management Solutions: Implementing reusable and biodegradable food packaging at food festivals*

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## Introduction

Food festivals are a major tourist attraction that creates a unique social setting in which consumers taste, experience, and learn about diverse cuisines and cultures. While these festivals can drive tourism in their hosting communities, they can also have a lasting negative environmental impact by placing a demand on the resources of the hosting communities (Kim & Kim, 2018). In recent years, sustainability initiatives have received increasing attention as festival attendees have become more aware of their behavioral impact on the environment. Consumers are increasingly looking for green events, or events that have “a sustainability policy or incorporate sustainable practices into [their] management and operations” (Laing & Frost, 2010, p. 262). Kim and Kim (2018) define sustainability as “the ability to develop and manage businesses that can meet the needs of today’s generation without compromising the ability of future generations to meet their needs” (p. 2). Some festival planners have addressed environmental concerns by introducing alternative waste management solutions that reduce food packaging waste. Reusable dishware programs and biodegradable and compostable food packaging products have also proven to be successful alternatives to the typical polystyrene or polypropylene tableware products typically distributed at festivals.

While discarded food packaging is a major contributor to waste in food festival settings, it can be a challenge for festival planners to implement lasting waste management solutions for short-term events. The waste generated at these types of festivals includes food waste, plastic or laminated paper dishes, plastic or laminated paper cups, foam containers, plastic cutlery, paper tablecloths, paper napkins, plastic bottles and more (Razza, Fieschi, Innocenti, & Bastioli, 2009, p. 1424). Disposable tableware is generally distributed in festival settings to simplify management, assure sanitation, and aid in post-event cleanup (Razza et al., 2009). According to Razza et al. (2009), “this practice has the negative consequence of both increasing the quantity and changing the quality of waste produced” by stallholders by creating a mixed heterogeneous waste mixture consisting of food waste and non-compostable tableware (p. 1424). This waste is then disposed of in landfills or incineration chambers because it cannot be recycled. These

waste management practices are fairly common because industrial dishwashers are not always accessible at food festival sites, further complicating the implementation of reusable tableware programs. However, reusable tableware programs that employ a deposit-refund system have proven successful and cost-effective (Tchobanoglous, Karagiannidis, Leverenz, Cadji, & Antonopoulos, 2006) and may be a workable alternative to disposable dishware.

Several festivals have implemented alternative waste management solutions to address food packaging waste by providing biodegradable and compostable (B&C) food packaging options. Advances in technology have led to developments in compostable materials, and planners can now use “drinking cups made out of polylactic acid, paper dishes laminated with biodegradable plastic foils, starch-based cutlery, foam clamshells” (Razza et al., 2009, p. 1425) and more, to manage waste more sustainably. Organic recovery, such as composting or anaerobic digestion followed by composting, can break down the heterogeneous mixture of food waste and biodegradable food packaging (Razza et al., 2009). B&C options generally cost more than typical polystyrene or polypropylene tableware products, but festival planners can market this investment to create a competitive advantage. Green events attract environmentally conscious people as they often view festivals as an opportunity to “act in an environmentally friendly way, express environmental concerns and engage in green activities” (Wong, Wan, & Qi, 2014, p. 296). Festival planners must prioritize proactive planning and collaboration to ensure a smooth transition from traditional to alternative programs.

## Background

Today’s festival planners are expected to entertain expanding populations while simultaneously dematerializing the event. This expectation comes from a growing environmental concern regarding the events industry. According to a study by Kim and Kim (2018), the events industry is the “second-most wasteful industry in the United States after construction” (p. 1). A recent consumer report concluded that “88% of festival attendees consider festival organizers to be responsible for minimizing the environmentally harmful effects of festivals, whereas only 57% and 42% indicated that such responsibility falls to individual festival goers and local authorities, respectively” (Kim & Kim, 2018, p. 1). This research suggests that sustainability initiatives at food festivals can generate a competitive advantage when marketed effectively to attendees.

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Various studies have found that attendees are willing to spend more at green events. Kim and Kim (2018) found that “a festival’s use of sustainable sources of foods, adoption of eco-friendly practices and dedication to green design and green management all influence the perceived value of festivals among attendees and how much they will spend to attend them” (p. 2). Wong et al. (2014) reported that festival attendees pay as much as 28% more for food at events they perceive as offering “green values” (p. 294). These findings imply that sustainable waste management practices can generate additional revenue for a festival.

Food festivals generate a non-recyclable mixture of waste that negatively impacts the host communities when improperly managed. Waste creation is often the most visible impact of an event, and attendees expect festival planners to properly manage waste when the festival ends (Allen, O’Toole, Harris, & McDonnell, 2011, p. 367). This waste can be managed by “controlling what food and drink is sold at the event, restricting what people can bring and managing the interface between exhibitors and the audience” (Allen et al., 2011, p. 367). Reusable dishware programs and B&C food packaging are two examples of sustainable waste management practices at food festivals.

### Reusable Food Packaging

Reusable dishware programs are proving to be successful at various festivals. For example, the Whole Earth Festival (WEF), an annual event at the University of California, Davis, implemented a reusable cutlery and dishware program in 2002 (Tchobanoglous et al., 2006). This integrated prevention plan sought to minimize solid waste generation, reducing overall weight of waste, compost, and recyclables by 27, 27, and 36%, respectively, when compared to their previous event in 2000 (Tchobanoglous et al., 2006, p. 824). Reusable dishware that included plates, cups, chopsticks, and utensils was purchased for the festival (Tchobanoglous et al., 2006, p. 824). In order to use the reusable dishware at the festival, attendees paid a small deposit fee (see Table 1).

Instructions for the reusable dishware program were communicated to vendors and attendees before and during the event via signage, email, and word of mouth. According to Tchobanoglous et al. (2006), “a method was developed for making the dishware accessible

for food vendors during the event, easy for customers to return their dishware and get refunded, and an effective cleaning and redistribution system” (p. 827). This method is illustrated in Figure 1. The most common problem encountered was that attendees did not have sufficient small currency denominations for deposit refunds (Tchobanoglous et al., 2006, p. 829). Other drawbacks for this system were also identified. For example, festival planners had to organize significant volunteer efforts and provide industrial dishwashers for the event to ensure proper sanitation and meet health code standards.

Other festivals, such as Australia’s National Folk Festival and England’s Glastonbury Festival, execute similar programs. For example, the Australian National Folk Festival “developed a system in which all drinks sold on site are served in distinctive green mugs. These can be deposited in specific bins, from where they are collected, washed and returned to beverage stallholders for reuse” (Laing & Frost, 2010, p. 263). Festival organizers have saved approximately 35,000 disposable cups every year since 1992 (Laing & Frost, 2010, p. 263).

### Biodegradable and Compostable Food Packaging

Research has shown that a reusable dishware program is the most environmentally friendly option as it requires the fewest resources (Razza et al., 2009, p. 1425). Researchers acknowledge, however, that this program is not feasible for most food festival settings because industrial dishwashers are not always available. In addition, sourcing an adequate number of volunteers to operate the program can be challenging. Thus, festival planners should also consider implementing biodegradable and compostable (B&C) food packaging. These products produce uncontaminated waste that can be recovered or recycled through organic treatment.

Some festival planners prefer B&C food packaging over reusable dishware programs because it eliminates the need for waste separation and increases attendee engagement. According to Allen et al. (2016), “Involving the audience in the separation of waste at an event will help to achieve the twin aims of encouraging the audience to get into the recycling habit and doing some of the separation work for the

**Table 1**

### Deposit Amount for Dishware at Whole Earth Festival

Item	Deposit fee (USD\$)	Replacement cost (USD\$)
Plate	1.00	1.50
Cup	1.00	0.50
Mug	1.50	1.50
Utensil	0.50	0.13
Chopstick	0.50	0.11

**Figure 1**

## Graphical Illustration of Deposit-refund System Used for Reusable Dishware at Whole Earth Festival

Word description	Diagram of process
<ol style="list-style-type: none"> <li>1. Food vendors purchase dishware, cups, utensils, and napkins from WEF. The purchase price is equivalent to a pre-determined deposit fee.</li> <li>2. When distributing food and beverages with dishware, cups, utensils, and napkins, the vendor collects the pre-determined deposit fee from the customer (in addition to the price of the food or beverage).</li> <li>3. When the customers return the used dishware, cups, utensils, and napkins to the collection stations, their deposit is refunded.</li> <li>4. All dishware, cups, utensils, and napkins are cleaned and prepared for reuse.</li> </ol>	<pre> graph TD     A((1. Vendor acquires dishware)) --&gt; B((2. Vendor distributes dishware to customers))     B --&gt; C((3. Customers return dishware to WEF collection stations))     C --&gt; D((4. WEF cleans dishware and prepares for distribution to vendors))     D --&gt; A             </pre>

waste team” (p. 368). However, even if containers are provided for the separation of trash, festival goers do not always use them, which was the case at the annual Glastonbury Festival in England (Gillett, 2017). Although festival organizers may communicate to festival goers that trash should be disposed of properly, waste management is still a serious problem. Many festival attendees still choose to litter rather than use the provided waste containers.

The use of B&C food packaging requires the addition of a third bin for composting. If B&C waste makes its way to a landfill it creates methane, “a greenhouse gas many times more potent than CO<sub>2</sub>” (Allen et al., 2011, p. 369). B&C waste should be composted. Compost application can be beneficial for the reduction of fertilizers, carbon sequestration, reduction of irrigation water and as a substitute for peat (Razza et al., 2009, p. 1430). On average, 84% of waste goes to landfills and 16% is incinerated (Razza et al., 2009, p. 1426). Compost is a valuable soil amendment, and because of this, festival planners should work with the city to either provide a composting site near the proposed festival site, if there isn’t one already, or to ask the city to suggest a site that is already close to a composting site.

Razza et al. (2009) found significant impact reduction when switching from plastic disposable cutlery to B&C cutlery, indicating that B&C cutlery is the environmentally preferred option. For example, Figure 2 shows the solid waste produced in both scenarios. The current scenario refers to the use of plastic cutlery, and the alternative scenario refers to the use of B&C cutlery. After distributing 1,000 meals in a food festival setting (Razza et al., 2009, p. 1427), these figures indicate that the implementation of B&C cutlery reduces waste generation and improves waste recyclability.

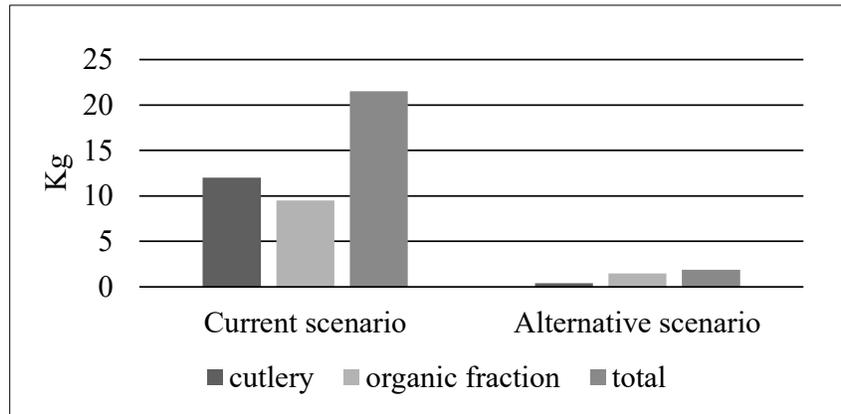
### Implementation

Festival planners face many challenges when addressing waste management solutions. Limited time, manpower, and budgets may lead festival stakeholders to believe that sustainability is not a worthy concern. Laing and Frost (2010) recommend that planners be “armed with information to support the need for and desirability of a green event, including research that supports their introduction and a cost-benefit analysis, to highlight the overall effects” (p. 262). Significant collaboration between festival planners, stakeholders, vendors, and attendees is necessary when communicating green initiatives. Therefore, it is important that all stakeholders are made aware of the benefits associated with sustainable waste management programs.

Of course, there are also obstacles to be faced when implementing an alternative food packaging program. According to Downes and Cordell (2016), “stallholders are very time-poor and under substantial pressure as a small business. It appears they have limited time and headspace to engage in anything they consider non-critical.” Sustainable initiatives must be feasible and accessible for vendors and attendees. Sustainability efforts affect hosting communities in different ways; therefore, a “one-size-fits-all” approach should never be used.

While implementing an alternative food packaging program poses some difficulty, opportunities are also created. Jong and Varley (2018) maintain that events can be used as a tool for promoting social sustainability. Marketing an event as “green” can engage attendees, increase sponsorship, and improve reputation (Kim & Kim, 2018). Festival organizers can promote sustainability efforts in their marketing campaign, which could create a cost benefit and competitive advantage for the event (Laing and Frost, 2010, p. 262).

**Figure 2**  
**Solid Waste Produced in Both Scenarios**



Significant education is necessary to help attendees, vendors, and other stakeholders understand the importance of sustainable practices in a food festival setting. Consumers may need instruction in how to properly separate their waste. Instructions may be communicated via pre-event emails or event signage. Event planners must also educate vendors about food packaging, as many will likely need to repackage their product. The festival planner could also include stipulations for food packaging in vendor contracts to increase program participation and accountability. Downes and Cordell (2016) encourage planners “to establish indicators for assessing the efficiency of the measures applied to develop and test new methods for assessing the performance of waste reduction measures” in food festival settings. While a zero-waste program may seem impossible, any effort to move towards this premise can minimize an event’s landfill footprint. However, a sustainable food festival can only be successful if a mutual understanding between festival organizers, attendees, and vendors is established.

## Conclusion

The event industry is undergoing rapid change in order to keep up with the public demand for sustainable development. Attendees and local governments now expect festival planners to include in their event plan sustainable waste management programs that reduce the traditional negative environmental impact of food festivals. Managing festival waste is difficult, as it is a heterogeneous mixture of compostable food waste and non-compostable packaging waste that includes plastic, Styrofoam, and various other waste materials (Razza et al., 2009). Advances in technology, however, can help event managers implement waste avoidance strategies in a variety of ways, including providing vendors with accurate attendance forecasting, working with local municipalities to create on-site or nearby food waste composting, and requiring that vendors use reusable or biodegradable food packaging. Festival organizers also need to market and communicate

green initiatives to festival attendees in order to increase event revenue by capitalizing on competitive advantage potential.

Dematerializing a food festival requires significant collaboration among event planners, stakeholders, local municipalities, volunteers, and attendees. Organizations such as the Green Meetings Industry Council, A Greener Festival, and The Sustainable Event Alliance can provide festival planners with helpful resources, certifications and guidelines. According to Allen et al. (2011), “if all event organizers keep sustainability at the heart of their planning, the industry can play a role in creating a sustainable future” (p. 360). Festival planners need to take responsibility for their events by developing proactive waste management solutions that create sustainable futures for event participants and hosting communities.

## References

- Allen, J., O’Toole, W., Harris, R., & McDonnell, I. (2011). *Festival & special event management* (5th edition). Milton, Australia: Wiley & Sons.
- Downes, J., & Cordell, D. (2016). *Food waste at festivals and markets: Background research*. Retrieved February 12, 2019, from University of Technology Sydney website: <http://foodstallsavers.org.au/wp-content/uploads/2016/07/LFHW-Background-research-report-v1.0-FINAL.pdf>
- Gillett, F. (2017, June 26). This is what worthy farm looks like as Glastonbury clean-up begins. Retrieved April 12, 2019, from <https://www.standard.co.uk/news/uk/glastonbury-festival-2017-mammoth-cleanup-begins-as-revelers-leave-behind-filth-and-waste-a3572861.html>
- Jong, A. D., & Varley, P. (2018). Food tourism and events as tools for social sustainability? *Journal of Place Management and Development*, 11(3), 277–295. doi: <https://doi.org/10.1108/jpmd-06-2017-0048>
- Kim, W., & Kim, K. (2018). Pro-environmental intentions among food festival attendees: An application of the value-belief-norm model. *Sustainability*, 10(11), 3894. doi: <https://doi.org/10.3390/su10113894>
- Laing, J., & Frost, W. (2010). How green was my festival: Exploring challenges and opportunities associated with staging green events. *International Journal of Hospitality Management*, 29(2), 261–267. doi: <https://doi.org/10.1016/j.ijhm.2009.10.009>

- Razza, F., Fieschi, M., Innocenti, F. D., & Bastioli, C. (2009). Compostable cutlery and waste management: An LCA approach. *Waste Management*, 29(4), 1424–1433. doi: <https://doi.org/10.1016/j.wasman.2008.08.021>
- Tchobanoglous, G., Karagiannidis, A., Leverenz, H., Cadji, M., & Antonopoulos, I. (2006). Sustainable waste management at special events using reusable dishware: The example of Whole Earth Festival at the University of California, Davis. *Fresenius Environmental Bulletin*, 15(8A), 824–830.
- Wong, I. A., Wan, Y. K., & Qi, S. (2014). Green events, value perceptions, and the role of consumer involvement in festival design and performance. *Journal of Sustainable Tourism*, 23(2), 294–315. doi: <https://doi.org/10.1080/09669582.2014.953542>