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# NEGATIVE HEALTH AND ENVIRONMENTAL IMPACTS OF REUSABLE SHOPPING BAGS

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BY

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## INTRODUCTION

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The reusable shopping bag has been touted as an environmentally friendly alternative to plastic and paper disposable carry out bags. But is it? Proponents always mention the advantages of the reusable bag but fail to mention the disadvantages. For example, if reusable shopping bags are not washed on a regular basis, there will be a buildup of bacteria, yeast, mold, and coliforms which if they come in contact with food items could be a potential health hazard. In addition, the reusable shopping bag can also act as a carrier to transmit contagious viruses that could make other people ill. Washing shopping bags will maintain them in a sanitary condition; however, that means the use of water, electricity, natural gas, soap and bleach and generation of greenhouse gases on a recurring and continual basis. This makes the reusable shopping bag the least environmentally friendly bag available. Also, using water and energy to maintain a bag in a sanitary condition when off-the-shelf sanitary plastic and paper bags exist, is a waste of resources, resources that consumers have been instructed to conserve, and resources that consumers will have to pay for!

## HEALTH HAZARDS

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### SUMMERBELL STUDY

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Two different studies<sup>1</sup> have been conducted by microbiologists to determine if any health hazards exist with the use of reusable bags to carry groceries and other food items. The first study, also known as the Summerbell Study<sup>2</sup>, was conducted by Dr. Richard Summerbell in Toronto, Canada and is available [here](#). The study tested a number of “used” reusable shopping bags which revealed the following:

- 64% of bags tested had some level of bacteria
- 30% of bags tested had elevated bacterial counts
- 24% of bags tested showed presence of mold
- 20% of bags tested indicated the presence of yeast
- 12% of bags tested had an unacceptable coliform count

The study concluded that “reusable grocery bags can become an active microbial habitat and a breeding ground for bacteria, yeast, mold, and coliforms.” The study also noted that the presence of yeast and mold may be of concern for people with compromised immune systems or allergies. In addition the study concluded that the use of reusable bags as a multi-purpose tote is a cause for concern particularly if used to transport gym clothes or dirty diapers. The study also recommended that reusable bags be periodically replaced to prevent bacteria buildup.

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## LOMA LINDA STUDY

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The second study<sup>3</sup> titled “Assessment of the Potential for Cross Contamination of Food Products by Reusable Shopping bags” was conducted by the Department of Soil, Water and Environmental Science at the University of Arizona in Tucson; in conjunction with the School of Public Health, Loma Linda University in Loma Linda, California and is available [here](#). The cross contamination problem can best be described in the following quotation from this study:

“Most foodborne illnesses are believed to originate in food prepared or consumed in the home.<sup>4</sup> Cross contamination of foods during handling is one of the factors leading to this statistic. Cross contamination occurs when disease causing microorganisms are transferred from one food to another. For example raw meat products are often contaminated with foodborne bacteria such as Salmonella and Campylobacter. While cooking these foods usually destroy these bacteria they may be transferred to other foods, which may be consumed uncooked, or contaminate the hands of consumers and be directly transferred to the mouth resulting in infection. Transfer may occur by surfaces such as cutting boards, kitchen counter tops and by the hands. “

This study included a larger sampling of reusable bags than the Summerbell study in Canada. The study included interviews of bags users to determine a profile of bag usage. The following are some of the statistics from the study:

- 49% used the bag once per week; 22%, twice per week; 18%, three times per week; 11% more than three times per week
- 70% used the bag solely for groceries; 30%, for other uses
- 75% did not use separate bags for meats and vegetables; 25%, did
- 55% transported bags in the automobile trunk; 45% in the back seat
- 55% stored bags in the home; 45%, in the automobile
- 97% did not wash bags; 3% did<sup>5</sup>

The fact that 97% did not wash their bags; that 45% stored bags in the car; that 75% did not use separate bags for meats and vegetables; and that 30% used bags for other uses, are all factors that lead to high bacteria counts and the potential for cross-contamination. The bacteria counts that were identified in this study included the following:

- Most used bags showed some level of bacteria
- 51% of bags had Coliform bacteria
- 12% of bags had Escherichia Coli (E. Coli)

The bags containing Coliform bacteria indicate the bags were contaminated by raw meats or other uncooked food products and the presence of E. Coli indicates fecal contamination. The presence of

these bacteria demonstrates that bags **do** become contaminated and that food borne pathogens **do** exist on the bags.

The study also evaluated the potential for bacterial growth when reusable bags were stored in the trunk of car for two hours resulting in a 10-fold increase in bacteria.

The study concludes that “A potential significant risk of bacterial cross contamination exists from using reusable bags to carry groceries. “ The study further identified that hand or machine washing reduced the quantity of bacteria in reusable bags by more than 99.9%. **The study recommended that reusable bags be washed on a regular basis and that the public be educated on the proper use and care of reusable bags.**

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### ABC NEWS INVESTIGATION

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While some people question the studies, a [video](#) produced by ABC News Call 7 Investigators collected bags from shoppers and tested the bags for bacteria. The lab results were taken to Dr. Michelle Barron an infectious disease expert at the University of Colorado Hospital. Three bags had relatively low bacteria counts presenting little risk of illness; two, moderate bacteria counts presenting moderate risk of illness; and two, extremely high bacteria counts presenting high risk of illness. Some of the bags also showed high levels of yeast and mold. The investigator also dusted a grocery bag with a substance that glows in the dark to demonstrate how harmful germs can travel, from the bag, to the groceries and hands, to countertop, to the cupboard and refrigerator. Dr. Barron also suggested the bags be washed or sanitized with bleach wipes after each use. She also stated "We're trying to be environmental. I fully support that. But not at the cost of your health."<sup>6</sup>

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### HEALTH CANADA ADVISORY

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The Department of Health in Canada issued an Advisory and Warning<sup>7</sup> titled “Health Canada Reminds Canadians to Avoid Cross-Contamination When Using Reusable Grocery Bags and Bins”, available [here](#). The Advisory reminded Canadian citizens and residents to wash their reusable bags and bins to prevent food-related illnesses and provided some guidelines in segregating foods and using your reusable bags in a safe manner. What is important here is that the Canadian Department of Health validated the concerns expressed in the Summerbell study.

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### BACTERIA LEVELS

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The Summerbell and Loma Linda studies both documented that bacteria, yeast, mold and coliforms are present in reusable shopping bags. The City of San Jose in their Environmental Impact Report (EIR)<sup>8</sup> minimized the concern for bacteria levels in reusable shopping bags by citing another study<sup>9</sup> showing that people are exposed to much higher bacteria and coliform levels on surfaces in the home such, as a table top, counter top, and cutting board. However, they miss the point entirely! The issue is not exposure to bacteria; the issue is bacterial contamination of food items that are ingested uncooked and could result in a food borne illness. A better example would have been to compare bacteria and coliform levels on dishes and cookware and cutting boards that have been washed in the dishwasher

which kills 99.9% of bacteria.<sup>10</sup> In that case, the bacteria levels in the reusable bag are thousands of times greater.

Australian Microbiologist Craig Andrew-Kabilafkas states: “With so many toxin producing germs lurking in the kitchen, vigilance is paramount. The best way to safeguard your household from unnecessary bouts of illness is to ensure eating utensils and food preparation tools are kept as bacteria free as possible by washing them at a very high temperature. Only a dishwasher can safely wash dishes at temperatures around or above 68°C which is needed to effectively kill 99% of bacteria.”<sup>11</sup>

What needs to be kept in mind is that there are various strains of bacteria, some of which are found in your own household and are safe, but other strains can cause severe food poisoning and even death.<sup>12</sup>

The Centers for Disease Control (CDC) estimates that each year roughly 1 out of 6 Americans (or 48 million people) get sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases.<sup>13</sup>

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### PLASTIC BAG BAN LEADS TO DEATHS AND EMERGENCY ROOM VISITS

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San Francisco County in California was the first major jurisdiction to enact a ban on plastic bags in 2007. In a report titled “Grocery Bag Bans and Foodborne Illness” the authors discovered that death from foodborne illness increased by 46% or 5.5 deaths after the plastic bag ban for the county was implemented. In addition, the report cites that Emergency Room (ER) visits increased by 34% or 40 visits where E. Coli is the principal diagnosis. Using various statistical methods the authors show that deaths increased between 5.4 to 15.8 and ER visits increased from 40 to 70. These results understate the true total effect because many individuals likely suffer food borne illnesses without going to the hospital or dying. The authors of the report state that similar results are seen in other areas where plastic bags are banned.<sup>14</sup>

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### LIFE-LONG CONSEQUENCES OF FOODBORNE PATHOGENS

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The Center for Foodborne Illness Research and Prevention published an article entitled “The Long-Term Health Outcomes of Selected Foodborne Pathogens” documented **potential life-long complications** from foodborne pathogens:

“Foodborne disease is a serious public health issue that, according to the Centers for Disease Control and Prevention (CDC) causes tens of millions of acute illnesses, hundreds of thousands of hospitalizations, and thousands of deaths each year in the United States. While the severity of acute foodborne disease varies greatly, depending on the pathogen and the vulnerability of the person infected, the impact of foodborne illness on children, as well as for the elderly and immune-suppressed (e.g., pregnant women, people undergoing chemotherapy, organ-transplant recipients, HIV/AIDS patients), is more likely to be serious and/or long-lasting.”

“Diarrhea and vomiting are common symptoms, and in most cases, last for only a few days. **However, most foodborne pathogens can cause, in a small percentage of cases, serious acute and/or life-long complications, including: kidney failure; paralysis; seizures; hearing/visual impairments and mental retardation.**”<sup>15</sup>

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## VIRUS HEALTH HAZARDS

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### LESSONS FROM THE OREGON NOROVIRUS INCIDENT

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In 2010, six members of an Oregon soccer team became ill with acute gastroenteritis during a weekend soccer tournament, news article<sup>16</sup> available [here](#). A concerned mother contacted Public Health authorities and Oregon Public Health investigators were able to confirm that the norovirus that made the girls ill was transmitted via a reusable shopping bag<sup>17</sup>. There are two things we learn from this incident:

- Public Health Officials traced the source of the virus outbreak to the reusable bag.
- That the reusable bag can transmit contagious viruses.

The significance of the first point is that without public health involvement, the source of the illness or method of transmission would **not** have been identified. Similarly, in the event a family does not wash their reusable bags and become ill with a food related illness, they would place the blame on bad food or the flu. The reusable bag would never be identified as the culprit; hence, incidents of illness related to reusable bag contamination will be **under reported**.

The other significant point we learn from the Norovirus outbreak is that the reusable bag can act as a medium to transmit the virus to others. Researchers determined that members of an Oregon soccer team became ill after touching a contaminated reusable shopping bag. The researchers determined that airborne contamination of fomites (contaminated objects) can lead to subsequent outbreaks.<sup>18</sup>

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### DISEASE TRANSMISSION VIA REUSABLE BAGS

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Like the Norovirus, the influenza virus can also be spread by fomites. The infected person who has touched their nose or eyes (conjunctiva) with their hands will transfer the virus to their hands and subsequently when touching an object transfer the virus to the object (or fomite). If the object is a reusable shopping bag then the shopping bag will be able to transfer the influenza virus to others. The influenza virus has been known to persist on paper currency for several weeks.<sup>19</sup>

In the event of an influenza outbreak, the reusable shopping bag will serve as a carrier for transmission of the virus to others. *It may be necessary, to ban the reusable bag during an influenza outbreak, or require people to wash their bags before coming to the store, or require clerks who handle the bags to wear gloves.*

Other diseases that are commonly spread by means of fomites (contaminated objects) include the common cold, cold sores, conjunctivitis, coxsackievirus (hand-foot-mouth disease), croup, E. coli infection, Giardia infection, influenza, lice, meningitis, rotavirus diarrhea, Respiratory syncytial virus (RSV), and strep.<sup>20</sup>

With respect to the norovirus outbreak, Dr. Charles Gerba, a professor in the Departments of Soil, Water and Environmental Science at the University of Arizona who conducts research about the transmission of pathogens through the environment, issued the following statement:<sup>21</sup>

“The latest outbreak of norovirus reinforces the research we have conducted about the propensity of reusable grocery bags to act as hosts for dangerous foodborne bacteria and viruses. In reality, **reusable bags are likely at fault much more often than we realize: cases often go unreported and uninvestigated.**

“The cause of roughly 70 percent of foodborne illness cases, the norovirus spreads very easily and Symptom's include projectile vomiting and severe diarrhea. It can have such sweeping consequences as school and emergency room closures. **This incident should serve as a warning bell: permitting shoppers to bring unwashed reusable bags into grocery and retail stores not only poses a health risk to baggers but also to the next shoppers in the checkout line.**”

The Norovirus causes about 21 million illnesses, 70,000 hospitalizations, and 800 deaths a year in the United States.<sup>22</sup> Norovirus is also the most common cause of foodborne-disease outbreaks in the United States. Norovirus can spread quickly in closed places like daycare centers, nursing homes, schools, and cruise ships. Usually, it's transmitted by direct human contact and contaminated surfaces. Leafy greens such as lettuce, fresh fruits, and shellfish are commonly involved in foodborne outbreaks.<sup>23</sup>

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## OTHER FOOD SAFETY ISSUES

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Currently, detergents and cleaners and other hazardous items such as pesticides are bagged separately from other food items for safety reasons. Boxed laundry soap or detergent often leak granules of soap or detergent from the box. Similarly, liquid detergents and materials occasionally leak from a loose cap or directly from a break in the bottle. Soap and detergent and other cleaners as well as pesticides also smell that may affect food items if not bagged separately.

In the event of a pesticide or other chemical spill in a reusable bag, it may not be possible to reuse that bag for food items even if it is washed. This is because some pesticides or hazardous chemicals could be absorbed into fibers and into plastics used to construct the reusable bag. The bag may have to be disposed of for safety reasons.

To prevent cross contamination you either wash bags between uses or segregate your purchases into specific bags. Unfortunately, there is no universal method of marking bags for specific uses, and store personnel will not know or be able to readily determine into which bags to place your food items unless that is communicated to them each time you are the store. Since store personnel are usually very busy, the likelihood of following any kind of bag segregation method is low. Store personnel must then remember what you told them or they will do it wrong and potentially cross contaminate food products with bacteria or soap or detergent or pesticide spill from your last use.

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## ERGONOMIC SAFETY ISSUES

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According to Reusable Bag Guidelines<sup>24</sup> there is concern that the reusable bag also presents ergonomic safety issues related to the fact that the weight of individual bags increased from an average of 10 lbs. for a plastic bag or a small reusable bag to 28 lbs. and 38 lbs. for the respective medium and larger versions of the reusable bag. The increase in weight is responsible for an increase in musculoskeletal disorders in retail store workers and could also be a concern for customers when lifting heavy bags

including potential liability issues. In addition, for people who have back problems or have had back surgery and are restricted from lifting more than 10 lbs. heavier reusable bags also pose a problem.

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## AT RISK POPULATION GROUPS

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To minimize health risks, periodic washing of reusable bags and segregation of food products into separate bags is recommended. Per the Loma Linda University study, because 97% of people do not wash their reusable bags and 75% of people do not segregate food products it becomes a legitimate concern and reason for educating the public.

Most people will have no problems maintaining their reusable shopping bags in a sanitary condition; however, there are several at risk population groups including immunocompromised individuals, the homeless, the elderly, and the disabled. Each of these groups presents a unique set of characteristics that that will put them at risk from health hazards associated with reusable shopping bags. The main concern is the ability to maintain reusable shopping bags in a sanitary condition and the ability to segregate food products to prevent cross contamination.

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## IMMUNOCOMPROMISED<sup>25</sup> INDIVIDUALS

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Individuals who are Immunocompromised are not capable of battling infections because of a weakened immune system. This includes people who have HIV or AIDS, leukemia, lymphoma, undergoing chemotherapy or radiation therapy for cancer, are pregnant or who take immunosuppressive post-transplant medications. According to the article “Sensitive populations: who is at the greatest risk?” 20% of the population belongs to this group who are at greater risk to food and waterborne illnesses than the population at large:

In assessing the potential impact of food and waterborne disease, it is important to recognize that certain individuals may be at greater risk of serious illness than the general population. Individuals who are at increased risk of developing more severe outcomes from microorganisms are the very young, the elderly, pregnant individuals, and the immunocompromised (organ transplants, cancer patients, AIDS patients). This group represents almost 20% of the current population in the United States ... The elderly and the immunocompromised are an ever increasing segment of the population whose numbers are expected to increase in the years ahead. This article presents an assessment of the increased risk for segments of the population from enteric pathogens which may be either water or food borne.<sup>26</sup>

**Immunocompromised<sup>27</sup> Individuals would be best served by using sanitary plastic and/or paper bags vice a reusable bag or alternatively washing their reusable bags between uses.**

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## THE HOMELESS

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A significant number of the homeless live in the street, in their vehicles, or in make shift housing comprised of tents, crates, and cardboard boxes in encampments located in river bottoms, under freeway overpasses, and empty lots. Living conditions in these encampments can be dangerous to one's health. Garbage attracts rats, mice, and various other rodents. In these encampments food cannot be stored properly, dishes cannot be washed properly thereby facilitating the spread of food-borne diseases. In most cases, there are no public toilet facilities nearby and the homeless defecate and

urinate in outdoor locations.<sup>28</sup> Poor hygiene contributes to a variety of health problems including heart disease, cancer, liver disease, kidney disease, skin infection, HIV/AIDS, pneumonia, tuberculosis, sexually transmitted diseases, and meningitis. Alcohol and drug addiction are also major problems.<sup>29</sup>

Further compounding the environment of homeless encampments are diseases that are transmitted by rats and mice or other rodents that are attracted to the garbage. Diseases include Eosinophilic Meningitis, Rat-Bite fever, Leptospirosis, Hantavirus Pulmonary Syndrome (HPS), Murine Typhus, Salmonella Enterica Serovar Typhimurium, and Bubonic Plague.<sup>30</sup>

In addition, riverine environments are also a source of Cholera. Transmission is primarily by the fecal contamination of food and water caused by poor sanitation. This bacterium can, however, live naturally in any environment.<sup>31</sup>

If a plastic bag ban is in place, the homeless will gravitate to using reusable bags, because they are more durable and can hold more stuff. Paper bags will not survive long in the riverine environment. The homeless simply do not have the facilities to wash their reusable bags and will be unable to maintain their bags in sanitary condition, putting themselves at further risk for food-borne illness. Their bags when stored in their unsanitary environments would attract rodents looking for food, and potentially contaminating the bags with dangerous viruses, such as the Hantavirus.<sup>32</sup> Then when they take their shopping bags from the unsanitary environment of the homeless encampment to the grocery store, their unsanitary reusable shopping bags constitute a health hazard for store clerks and other shoppers. The same is true for shopping carts used by the homeless, when returned to the store they constitute a health hazard for shoppers.<sup>33</sup>

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## THE ELDERLY AND DISABLED

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Another At Risk Population group is the elderly and the disabled. While many elderly and disabled are mentally alert and fully capable of taking care of themselves, others have disabilities and impairments<sup>34</sup> that make household chores difficult if not impossible to perform. They are simply not able to keep their reusable bags in a sanitary condition or even to keep food products segregated when shopping. Many of the elderly live on fixed incomes and may be extremely hesitant to use water and soap required to keep bags in a sanitary condition. Therefore the elderly and disabled are at greater risk from food borne illness than the population at large. The elderly are also at serious risk for infections such as pneumonia, influenza, tuberculosis<sup>35</sup>, salmonellosis, and hepatitis some of which may result in death.<sup>36</sup> In addition, transmission of the norovirus, the influenza virus, or other diseases transmitted via a reusable bag is a legitimate health concern. Also the elderly are at risk for injury when attempting to lift heavy reusable bags filled with groceries/purchases.

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## HOW TO USE AND CARE FOR REUSABLE BAGS

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Caring for reusable bags involves both washing or sanitizing of bags and also using separate bags for different types of groceries. A number of fact sheets exist that explain how to care for reusable bags. A fact sheet called "Practice Safe Sacks" provides guidelines for using reusable bags safely and can found [here](#). Another fact sheet<sup>37</sup> is available [here](#) with tips for cleaning bags and also using them.

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## WASHING REUSABLE BAGS

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Many people dismiss the health hazards associated with the reusable shopping bag. They say when it gets dirty just throw it in the wash. That's pretty good advice; except, most people are not able to see bacteria or viruses. Hence, as a precaution regular washing should become the established practice.

Many people also dismiss the health hazards encountered by store employees saying that they could offer a paper bag in the event a customer's reusable bag is dirty. But again a bag could look clean and be laden with dangerous bacteria and contagious viruses.

The foregoing all point to the one undisputable fact that the reusable bag is a health hazard if not periodically washed to maintain them in a sanitary condition. The Loma Linda University study recommended that the bags be washed periodically or between uses if groceries are not segregated. While this seems excessive, it might not be if one or more family members have a weakened immune system, taking certain medications, or has some other medical condition or allergy. Each family will have to make their own decisions about how often to wash their bags. **Washing bags to maintain them in sanitary condition means the increased and recurring consumption of water, electricity, natural gas, soap and bleach.**

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## INCOMPLETE LIFE CYCLE ASSESSMENTS

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Life Cycle Assessments (LCA) reports, referenced in Environmental Impact Reports(EIRs), attempt to identify the impact to the environment during the manufacturing and disposal/recycling process of the different types of paper, plastic, and reusable bags. The impact to the environment is analyzed with respect to water use, energy consumption, generation of greenhouse gases, chemicals used, etc.

Life Cycle Assessment (LCA) reports looked at include the "Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper" by Boustead Consulting & Associates<sup>38</sup>; "Life Cycle Assessment of Supermarket Carrier Bags"<sup>39</sup> by the UK Environment Agency; and "Life Cycle Assessment of Reusable and Single-use Plastic Bags in California" by the California State University Chico Research Foundation<sup>40</sup>; and, the "Master Environmental Assessment on Single-Use and Reusable Bags" by Green Cities.<sup>41</sup> All of the above mentioned LCA reports are **incomplete** with respect to the reusable shopping bag in that they do **NOT** identify the impact to the environment by the recurring consumption of water, electricity, natural gas, soap and bleach and the resulting sewer discharge required for maintaining reusable shopping bags in a sanitary condition. **Hence, all LCA reports are INCOMPLETE!!**

The LCA reports identify that the plastic carry out bag has the lowest impact to the environment during the manufacturing and disposal process and then recommends the reusable bag as the bag with the lowest impact to the environment if used multiple times and on a per use basis. **However, the analysis is flawed because the LCA reports are incomplete and do not adequately deal with the consumption of water, electricity, natural gas, soap and bleach in order to maintain the reusable bag in a sanitary condition.**

Even though many consumers ([only about 15% wash their bags](#)) are currently not washing their bags like they should, there is still a requirement to maintain bags in a sanitary condition. This requirement should be modeled and characterized in order to determine the impacts to the environment once the public is educated or in the event a “scare” results in compliance with recommended washing protocols. A scientific study to characterize these impacts is needed. Then the LCA reports should be updated to accurately identify the impact to the environment.

**When you consider that sanitary plastic and paper bags are readily available, using water and energy resources to maintain the reusable shopping bag in a sanitary condition is a waste of those resources. Especially in light of the fact that water and electricity must be conserved. The recurring consumption of water and energy resources makes the reusable bag the least friendly to the environment of all the alternatives. The plastic carry out bag has lowest impact to the environment.**

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### INCREASED WATER USE

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Parts of the USA, including Southern California, are continually plagued by periodic drought conditions during which time laws and regulations concerning water conservation are enforced.<sup>42</sup> The Oxnard plains are further plagued with sea-water intrusion in the underground aquifers. The city of Ventura, during a normal year, obtains 20% of its water from the Ventura River, 45% from Groundwater Wells, and 35% from Lake Casitas.<sup>43</sup> Approximately half of the water consumed is pumped from underground [aquifers](#) contributing to sea-water intrusion under the Oxnard plains. United Water Conservation District uses both rainfall storm run-off and purchased water to replenish the aquifers. Rainfall in the Oxnard Plains is often not enough to replenish the water pumped by area wells.

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### UTILITY COSTS

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There are two types of reusable shopping bags, those that can be hand washed only and those that can be machined washed. Hand washable bags require less water and energy to wash and must be air dried and is therefore friendlier to the environment. However, hand washing bags is time consuming making it less likely those bags will be washed. Since it is much more convenient to machine wash and dry bags, over time consumers will opt for the higher cost cotton or fabric bags which can be machine washed and dried.

Utility costs for machine washing and drying will vary with the kind of appliances in the household. For example, a top-loading washing machine consumes up to 40 gallons per load, and a front-loader between 10-24 gallons per load. A gas dryer will consume less electricity than an electric dryer. A gas water heater is cheaper to operate than an electric water heater.

Table 1 shows the consumption of water and electricity for a typical household using a top loading washing machine and electric dryer. It was estimated that 10 reusable cotton washable bags would constitute a single load and annual consumption of electricity and water is shown if bags are washed once per month and/or once per week. The use of electricity or natural gas to heat water in a water heater was not considered. The table then extrapolates consumption of water and electricity to all households in the City of Ventura and Ventura County. Actual use of course will differ and depends upon the distribution of the type of washing machine, dryer, water heater, and hand washable verses machine washable bags in the city and county.

If you choose to machine wash and dry your reusable bags once per month the cost of your utilities would increase by about \$14 per year per household. If you wash them weekly, the increase would be about \$62 per year per household. An internet calculator<sup>44</sup> located [here](#) was used to calculate the annual cost. The cost varies with the type of washing machine, dryer, and water heater as well as utility rates.

	Per Load (Top Loader)	Yearly Cost (1 X per Month)	Yearly Cost (1 X per Week)
Washer			
Water	40 gallons/load		
Electricity	0.25 kWh		
Dryer			
Electricity	4.5 kWh		
<b>Total / Household</b>		\$14.31	\$62.00
Water	40 gallons/load	480 gallons	2080 gallons
Electricity	4.75 kWh	57 kWh	247 kWh
<b>Total / Ventura</b>		\$612,854.37	\$2,655,274.00
Water	42,827 Households in City of Ventura	20,556,960 gallons	89,080,160 gallons
Electricity		2,441,139 kWh	10,578,269 kWh
<b>Total / Ventura County</b>		\$3,480,678.54	\$15,080,508.00
Water	243,234 Households in Ventura County	116,752,320 gallons	505,926,720 gallons
Electricity		13,864,338 kWh	60,078,798 kWh
<b>Notes: (1) Figures assume all households use machine washable reusable bags.</b>			
<b>(2) Does not include the electricity or natural gas required for heating water.</b>			
<b>(3) Dollar figures represent the estimated increased utility costs.</b>			

TABLE 1. WATER AND ELECTRICAL CONSUMPTION FOR WASHING REUSABLE BAGS

Table 2 shows the Yearly Costs from low to high depending upon the type of appliances: front loader and top loader washing machine, gas or electric dryer, and gas or electric water heater. We calculated the annual utility cost for washing reusable bags on a weekly basis using three options for appliance type denoted by: Low, Mid, and High.

Using the internet calculator, the “Low” utility cost is for a front loading washing machine, gas dryer, and gas water heater which runs about \$37 per year. The “Mid” utility cost is for a top loading washer, electric dryer, and gas water heater which runs about \$62 per year. The “High” utility cost is for a top loading washer, electric dryer, and electric water heater which run about \$76. The annual utility cost for washing reusable bags on a monthly basis was computed from the Low, Mid, and High figures by dividing by 52 weeks and multiplying by 12 months. The increased utility costs for a single household are then extrapolated to the entire City of Ventura and the County of Ventura assuming a 100% participation rate in machine washing and drying of reusable bags. The purpose of this exercise is to identify that there are significant costs imparted to the public in the event a plastic bag ban is initiated and consumers must use reusable bags and wash them on a regular basis.

Table 2 shows that annual utility costs for washing bags upon a monthly basis will vary from \$8.54 to \$17.54 and on a weekly basis between \$37.00 and \$76.00 depending upon the type of washing machine, dryer, and water heater.

	Low/High	Yearly Cost (1 X per Month)	Yearly Cost (1 X per Week)
Household	Low	\$8.54	\$37.00
	Mid	\$14.31	\$62.00
	High	\$17.54	\$76.00
Total / Ventura 42,827 Households in City of Ventura	Low	\$365,742.58	\$1,584,599.00
	Mid	\$612,854.37	\$2,655,274.00
	High	\$751,185.58	\$3,254,852.00
Total / Ventura County 243,234 Households in Ventura County	Low	\$2,077,218.36	\$8,999,658.00
	Mid	\$3,480,678.54	\$15,080,508.00
	High	\$4,266,324.36	\$18,485,784.00
Notes: (1) Low assumes front loading washer, gas dryer and water heater. (2) Mid assumes top loading washer, electric dryer, and gas water heater. (3) High assumes top loading washer, electric dryer and water heater. (4) Dollar figures represent the increased utility costs.			

**Table 2. Yearly Costs depending upon type of appliances**

The cheaper bags available at the grocery stores are made from various plastics and may not really be machine washable or dryable. Cotton or Hemp bags that are durable and machine washable will cost the consumer somewhere between \$4 and \$23 each. I expect consumers will gravitate to machine washable bags for both durability and convenience. Which means more water and energy use.

For a family that has 10 machine washable reusable cotton bags (10 x \$4 = \$40 plus 7.25% sales tax is \$42.90) and wash them once per month for annual cost ("Mid" option) of about \$14.31 the total **first year cost is \$57.21**. In the event a family member has a compromised immune system or other medical condition and decides to wash the bags between uses, the cost would increase to about **\$104.90** per household for the first year. Most of the bags have to be replaced every other year, so consumers will get hit with the recurring cost of buying new bags.

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## REUSABLE SHOPPING BAG SECURITY RELATED ISSUES

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The reusable shopping bag presents several security issues:

1. Carrying a bundle of reusable bags into a retail establishment could be used to hide a weapon. This may be a concern for the Circle K or 7-Eleven type of convenience stores that are robbed frequently.
2. Carrying a bundle of reusable bags could increase shoplifting as reported in Ireland when the reusable bag was first introduced<sup>45</sup> and corroborated in Reusable Bag Guidelines.<sup>46</sup>
3. Shopping in a Mall where the customer goes from store to store carrying a reusable bag brings up some interesting security and shoplifting scenarios (not described here to avoid giving people ideas).

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## REUSABLE BAGS MADE OVERSEAS

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While the plastic carry out bag is made in the United States, by an industry that employs more than 30,000 people nationwide, the reusable bag is largely made overseas,<sup>47</sup> thereby outsourcing American jobs. Reusable Bags made in China have been recalled due to high level of lead and other metals. In 2010/2011 Sears, CVS, Walgreens, Rite-Aid, Safeway were among the retail chains that have had to recall reusable bags.<sup>48</sup>

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### SUMMARY

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The Reusable Shopping Bag is NOT an environmentally friendly alternative to the plastic carry out bag. The bag presents both health hazards to consumers and requires the use of water and energy resources on a recurring and continual basis to maintain the bags in a sanitary condition. **Using water and electricity for this purpose is a waste of resources especially when plastic and paper sanitary bags are readily available off-the-shelf.**

The reusable bag presents two health hazards to consumers: (1) the buildup of bacteria, yeast, mold, coliforms and E-Coli that can potentially cause foodborne illness or death; (2) the transmission of contagious viruses including the common cold virus, croup, Giardia, influenza, meningitis, rotavirus diarrhea, norovirus, strep, and many other diseases. Both of these health hazards can be overcome by regular washing or sanitization of reusable bags. Unfortunately only about 15% of people wash their bags. **Therefore, an ordinance to require consumers to use reusable shopping bags is NOT good public policy.**

Because of the negative health impacts of the reusable bag and the recurring consumption of water and energy resources, **this report concludes that the plastic carry out bag as currently used in grocery and other retail stores is the most efficient, safe, cost effective, and environmentally friendly product available and should remain in place.**

Additional efforts should be made to increase recycling of the plastic carry out bag and educating the public as to proper disposal and recycling methods.

In addition, the City of Ventura should complete current work (i.e. Ventura River trash Total Maximum Daily Loads project) on trash excluders on storm drains that empty into the Ventura River and should budget to add additional trash excluders on storm drains that empty into the Santa Clara river so that all plastic debris including plastic bags will be prevented from entering the river and ultimately the ocean.

**It is recommended that the proposed ordinance to ban plastic carry out bags be dropped due to health hazards identified herein and the recurring use of scarce water and energy resources and generation of greenhouse gases.**

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<sup>1</sup> Both studies have been funded by the chemical and plastics industries. Both studies were performed by well qualified microbiologists and by reputable organizations and institutions.

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