

# **The Diaper Decision - Not A Clear Issue**

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Textiles and Clothing

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Choice of diapers, cloth or disposable, impacts on environmental, health and economic concerns. Currently, neither diaper type is clearly superior in all areas. An understanding of the issues provides some basis for responsible choice.

Introduced in 1961, disposable diapers now dominate the market, accounting for 80 percent of the diapers used in the United States. Convenience is the major reason given by parents, particularly in dual-career families where time for cloth diaper care is limited. Group day care restrictions requiring single use diapers by registrants also influence choice of diapering method. Families without access to home laundry equipment find care of cloth diapers burdensome.

Associated with the convenience and market penetration of single use diapers is waste disposal. The average child uses over 5,000 diapers during the 30 month period before toilet training, contributing to a total of over 16 billion diapers or 2.7 million tons of single use diapers requiring disposal each year (1). Disposable diapers account for an estimated 1.5 to 2.0 percent of municipal solid waste, contributing to the existing problem of landfill availability and escalating cost of solid waste management (1,2).

## **Environment**

### **Disposable Diapers**

With landfills reaching capacity and dumping costs expected to quadruple by the year 2000, solutions for disposal of all solid waste, including disposable diapers, is a critical concern. Nearly \$300 million is spent annually to discard single use diapers. Disposable diapers generate four times as much solid waste as cloth diapers. An archaeological study of garbage from 1977 to 1985 determined that while fast food packaging accounted for 0.1 percent by weight of solid waste in landfills, disposable diapers accounted for slightly under 1.0 percent or nine to ten times that amount (3). However, some additional

concerns regarding the decomposition of disposable diapers and resulting by-products must be considered.

Disposable diapers are made from wood (cellulose based inside unit), chemicals (absorbent gel), and oil-based (polypropylene water-proof layer) materials. Some estimates suggest that 82,000 tons of plastic and 1.8 million tons of wood pulp (1/4 million trees) are consumed each year in the production of disposable diapers (4). However, wood pulp used in disposable diapers comes from tree farms operating for this purpose rather than forests or woodlands.

Use of disposable diapers consumes more raw materials for production and generates more solid waste after use than cloth diapers (5). Questions concerning the completeness of decomposition of both sections of the chemical plastic units in diapers exist. Some estimates suggest that decomposition of numerous solid waste materials takes longer than expected particularly with air and water (necessary for breakdown) often absent in landfills.

Another potential problem could be leachate, primarily from older landfills, entering ground water supplies. Viruses excreted in human feces could pose health problems long term. To date, no evidence of health care related waste (including diapers) causing disease in community water systems has been determined (6), nor have waste collection workers experienced increased occupational related viral infections (7). Biodegradable diapers are one option for parents. They are made from a cornstarch base and, when acted on by bacteria, more rapidly decompose than conventional disposable diapers. The process requires oxygen and water, however, often lacking in landfill operations. Biodegradable diapers may have more potential for composting uses than to address landfill concerns. Nevertheless, neither the quantity of solid waste contributed by diapers nor the potential spread of infection are eliminated with the biodegradable product.

### **Cloth Diapers**

Although disposable diapers pose environmental concerns from a solid waste perspective, cloth diapers raise concerns regarding air and water pollution. The reusable nature of cloth diapers reduces the solid waste problem, but creates other environmental concerns. Laundering of cloth diapers requires water, energy to heat the water and operate equipment, and chemicals in the form of laundry and sanitizing products that contribute to water pollution and additionally tax municipal water treatment systems.

A 1990 study concluded that cloth diapers used twice as much energy and four times as much water as disposables, and created greater air and water pollution than disposables (8). Commercial diaper services pose similar concerns, plus additional fuel use and air pollution created by delivery trucks. Emissions from home and diaper service drying equipment contribute to air pollution. While disposable diapers use more raw materials in the manufacturing process, cloth diapers use greater resources after use or care. Use of disposables raises a concern about solid waste management, while cloth diapers contribute to air and water pollution and possible taxing of municipal water and sewage systems.

Diapering methods must be evaluated in terms of resource use, pollution and solid waste management to determine which poses the most serious environmental problems for a given locale long term.

In areas where land is plentiful but water is in short supply disposable diapers may be the more environmentally responsible choice. In areas experiencing solid waste problems and decreasing landfills, but have adequate water supplies, cloth diapers or a combination of cloth and disposables may be the most environmentally responsible choice.

## **Health**

Other health issues impact on the diaper question. Diaper rash is related to excess skin wetness. While disposables draw moisture away from the skin and retain it in a chemical powder that forms a gel in contact with liquid, critics suggest that cloth diapers are changed more often and therefore are more likely to prevent diaper rash. Studies show that super absorbent disposables, perform best in reducing skin wetness. Cloth diapers provide the next best amount of protection and regular disposables provide the least (8). Frequent diaper changes and attention to hygiene are the most critical practices in dealing with diaper rash problems.

Most day care settings require children to wear disposable diapers for reasons of convenience as well as for hygiene. Studies show that children in group day care situations experience more frequent diarrhea than children cared for at home or individually (10). A recent study demonstrated that diaper leakage and resulting contamination of the day care setting is greater with cloth diapers and plastic pants, than with super absorbent disposable diapers (11).

No comparison data is reported for regular disposables that are less expensive and more commonly used than the super absorbent varieties.

### **Economics**

Economics and time management impact more directly on families when deciding to use cloth or disposable diapers. Disposables cost approximately \$50 per month, estimating 5 to 7 changes per day. The amount varies depending on the age of the child. Infants will have a greater number of changes and toddlers a fewer number of changes. An initial one-time investment for cloth diapers, including plastic pants and diaper pail, is about \$80. Home laundry costs including depreciation of equipment is estimated at \$1.35 per load (12). Washing one load per day, laundry costs equal \$40.37 per month. Commercial diaper services with weekly delivery and pick-up of soiled diapers average \$10 to \$15 per week or \$40 to \$60 per month. Parents generally use more cloth diapers (9.7 per day) than disposables (5.4 to 7.0 per day) due to more frequent changes and double diapering, especially at night. Use of cloth diapers costs considerably less than disposables in terms of actual dollars expended by the family for acquisition; however, overall cost of care including depreciation of home laundry equipment reduces the actual cost difference.

In dual career or single parent families, especially, time is precious. Laundering of diapers places additional demands on home and child care activities. Along with more frequent changes associated with cloth diapers, laundering becomes a realistic consideration in making diapering decisions. Availability of home laundry equipment further impacts on the decision.

### **Alternatives**

Efforts to reduce solid waste landfill problems to which disposable diapers contribute are in progress. In one pilot effort (13), disposable diaper component parts were collected, washed, separated and recycled. The wood pulp was sanitized and used in containers, wallboard and writing paper. At this writing, however, recovery costs do not make the effort financially feasible. Another pilot effort (14) includes separating the plastic cover from the diapers, then shredding and composting the soiled interior. Further research, currently being initiated, is needed to fully use these approaches.

Questions regarding biodegradable diapers still need to be resolved. Not only is speed of decomposition uncertain, but also disposition of residue from the bacterial action on the cornstarch product.

Some states have enacted legislation pending further study. Others are considering legislation to ban use of non biodegradable disposable diapers. One state proposed banning the sale of all disposable diapers, but did not pass the resolution. Currently, no related legislation is pending in Ohio.

**Personal Decision**

Which diaper to use is a personal decision for Ohio parents. No evidence exists that one method is clearly superior in terms of impact on health, environment, and economic issues. Personal values and needs, both for the child and the parents, must be considered. Geographic area and environmental concerns specific to that area including water supply, water and air pollution, and solid waste disposal all impact on the situation. Biodegradable diapers and recycling or composting of disposable diapers may offer potential over the long term. Combining diapering methods, with cloth for home and disposable away from home, is an alternative for individuals facing increasing landfill costs in their areas.

Overall health and environmental issues, including resource use and pollution as well as solid waste management and its implications, are not fully understood. Knowledgeable decisions made based on the issues and their long term impact are important. Parents play many roles in determining the future their children will face. Decisions made regarding the environment and long term impact is one of them. Learning about all aspects of the situation and making knowledgeable decisions is a first step.

A review of issues presented in this publication is provided below to help consumers make their evaluations concerning diapering needs.

Issues	Disposables	Cloth
Environmental Impact	<ul style="list-style-type: none"> <li>• Consumes both renewable and non-renewable resources in production</li> <li>• Increased cost for solid waste management</li> <li>• Problem where landfill concerns exist</li> </ul>	<ul style="list-style-type: none"> <li>• Reusable/Recyclable</li> <li>• Increased water and energy usage for laundry</li> <li>• Increased water and air pollution from laundry</li> <li>• Problem where water availability/ and air pollution concerns exist</li> </ul>

Health and Safety	<ul style="list-style-type: none"> <li>• Super absorbents reduce diaper rash better than regular disposables</li> <li>• Diaper leakage/contamination reduced with super absorbents</li> <li>• Required in some day care settings</li> <li>• Potential for leachate from landfills</li> </ul>	<ul style="list-style-type: none"> <li>• Diaper rash reduced with frequent changes</li> <li>• Increased diaper leakage/contamination</li> <li>• Municipal sewage system handles solid waste</li> <li>• No landfill problems/contamination</li> </ul>
Cost and Convenience	<ul style="list-style-type: none"> <li>• More convenient</li> <li>• Higher purchase cost</li> </ul>	<ul style="list-style-type: none"> <li>• Less convenient</li> <li>• Low purchase cost</li> <li>• Time and money cost for laundering</li> </ul>

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