The Feasibility of Requiring Food Service Operations to Use Biodegradable or Recycled-Content Food Packaging

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FOREWORD

This report on the feasibility of requiring local food service operations to use biodegradable or recycled-content packaging materials is submitted in response to House Resolution No. 376, H.D. 2, which was adopted during the 1994 Regular Session.

The Bureau wishes to acknowledge the assistance of the following state Department of Health personnel: Brian Choy--Sanitation Branch; John Yamauchi--Litter Control Office; and John Harder--Office of Solid Waste Management. The Bureau also wishes to acknowledge the contributions of Jim Hollyer--University of Hawaii Department of Agricultural Resource Economics; Celia Hildebrand--Business Analysis and Marketing Branch of the Department of Business, Economic Development, and Tourism; and Dick Botti--Hawaii Food Industry Association.

Samuel B. K. Chang
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Chapter 1

INTRODUCTION

Introduction

House Resolution No. 376, H.D. 2 (see Appendix A), was adopted by the House of Representatives during the 1994 Regular Session of the Legislature. H.R. No. 376, H.D. 2, requests the Legislative Reference Bureau to determine the feasibility of requiring local "take out" food service establishments to utilize biodegradable or recycled-content materials to package all fast food items manufactured and sold in Hawaii. The resolution also requests the Bureau to examine the laws in the states of New York and Washington to "determine the extent to which biodegradable and recycled packaging has been studied or placed in use in those states". The Bureau is further directed to "specify the means by which each biodegradable packaging material...will degrade, and the type of facility that will promote or hinder degradation".

Testimony in support of H.R. No. 376, H.D. 1, was presented to the House Committee on Energy and Environmental Protection by the state Department of Transportation and several local private business organizations.

Also presenting testimony was the state Department of Health. While the testimony fully supported the general idea of reducing litter in Hawaii, the department, nonetheless warned that:

> Biodegradable products do not reduce litter. In fact, they may increase litter by encouraging some people to think that it is okay to toss their trash because it will degrade.[1]

The department also cautioned that use of biodegradable packaging in Hawaii could prove to be counterproductive to other solid waste management efforts such as recycling:

> Packaging manufactured from biodegradable plastics is only marginally biodegradable and nonrecyclable. In fact, a single item made from biodegradable plastic can contaminate an entire batch of recyclable plastics, causing increased costs to the recycling process.[2]

Testimony was also presented by Jim Hollyer of the University of Hawaii Department of Agricultural Resource Economics. Mr. Hollyer noted that although considerable research has been conducted on biodegradable technology, the cost of using biodegradable materials continues to be "relatively high".[3] According to the testimony, the price of plastics designed to "degrade" averages around $2 to $3 per pound, compared to about 50 cents per pound for petrochemical resins.[4] Mr. Hollyer also noted that most of the biodegradable products

developed thus far are "not yet commercially available" and cautioned that the resolution "may be ahead of its time".[5]

H.R. No. 376, H.D. 1, was passed by the committee in an amended form, and was adopted by the House of Representatives on April 18, 1994 as H.R. No. 376, H.D. 2.

Summary of Problems and Issues Identified in H.R. No. 376, H.D. 2

H.R. No. 376, H.D. 2, identifies six basic concerns associated with "take-out" food packaging in Hawaii. The concerns identified below were taken directly from the text of the resolution and were utilized to direct the focus of the issues explored in this report.

(1) Disposable "take-out" food containers are becoming a "serious contributor to the problem of solid waste" in Hawaii.

(2) Take-out food containers are "nonrenewable resources" and are "made of materials that are not readily recyclable".

(3) Fast food containers, when incinerated, emit "toxic by-products such as chlorofluorocarbons (CFCs)".

(4) These containers "create litter on Hawaii's roads and highways".

(5) "Even when properly disposed (fast food containers) contribute to the premature filling of landfills".

(6) Items in take-out lunches "which are purely decorative, such as plastic ti leaves", adds to the "waste and litter problem".

Report Overview

While the food service industry has made impressive progress in areas such as source reduction, recycling, and product substitution over the past decade, concern over the effects of food packaging waste on the environment continues to present a public relations problem for the industry. The abundance of fast food packaging litter on the streets and in the parks of cities across the country creates the impression of a problem that is beyond control.

Among the issues generating the most public concern is the fast food industry's heavy use of plastic packaging materials. Strength, inertness, and durability--properties that make plastics so reliable in scores of packaging and manufacturing applications, also work to ensure their persistence in the environment. Recyclability and degradability--properties never before regarded as particularly relevant to the primary applications of plastics in packaging, have moved to the forefront of concern for manufacturers. Indeed, recent packaging industry

surveys indicate that consumers are increasingly basing their purchasing decisions on factors such as environmentally-oriented packaging and product designs.[6] Packaging designs that appear wasteful or harmful to the environment have become commercial as well as political liabilities for the distributors of such products. "Green marketing" has become a highly effective marketing approach for the manufacturers of products of every description and variety, and the growing demand for "environmentally-sensitive" packaging materials has given rise to a broad new area of research for packaging designers and engineers. Packaging manufacturers are desperately searching for new packaging ideas to capitalize on the demand of consumers--including the idea of using materials engineered to deteriorate without a trace upon disposal. At the same time, however, companies must contend with the unsettling idea--not to mention the possible health implications--of using "garbage" to manufacture materials intended to protect the quality of food items prepared for human consumption. While the search for alternatives has resulted in the development of a number of new products, the effort has also been fraught with gimmickery and failure. "Environmental issues" according to the chairman of the American Management Association's Council on Packaging, "will without question, remain the greatest packaging challenge during this decade".[7]

This report has been divided into six chapters. Chapter two examines the role played by fast food packaging in contributing to the problems of litter and solid waste generation. Chapter three reviews the history of food packaging and provides a background on the use of plastics in food packaging. Chapter four examines the progress of biodegradable and recycled-content food packaging technology as well as the federal Food and Drug Administration's role in approving the use of any new food packaging material. Chapter five reviews the laws of New York and Washington and presents an overview of the voluntary programs administered by several of the country's leading food service organizations. Chapter six reports the findings and recommendations of the Bureau.

ENDNOTES

1. Testimony of John C. Lewin, M.D., Director of Health, before the House Committee on Energy and Environmental Protection, April 6, 1994, p. 1.

2. Ibid., p. 2.

3. Testimony of Jim Hollyer, Department of Agricultural and Resource Economics, College of Tropical Agriculture and Human Resources, University of Hawaii, before the House Committee on Energy and Environmental Protection, April 6, 1994, p. 1.

4. Ibid.

5. Ibid., p. 2.

6. Carl C. Hein III, Management Review, November 1993, vol. 82, issue 11, p. 55.

7. Ibid.

Chapter 2

FAST FOOD PACKAGING AS A COMPONENT OF LITTER AND THE SOLID WASTE STREAM

Introduction

H.R. No. 376, H.D. 2, targets one particular constituent of the solid waste stream for analysis in this report, namely, fast food packaging waste. Although fast food packaging waste is a highly visible form of solid waste, the municipal solid waste stream is obviously made up of a large number of separate and uniquely problematic components. In this regard, it is critical that a clear working definition of fast food packaging waste be established at this stage of the report. This chapter establishes such a definition and examines the role of fast food packaging waste in contributing to the problems of litter and municipal solid waste generation in Hawaii.

Establishing a Definition for "Fast Food Packaging Waste"

According to the United States Environmental Protection Agency, "containers and packages" represent approximately one-third of the wastes found in the municipal solid waste stream of the United States. Wastes in this category include the packaging wastes from all packaged goods purchased by consumers--including food and nonfood items. Nonfood packaging refers to the packaging materials used to package the diverse array of nonfood products purchased by residential, commercial, and industrial consumers. Food packaging refers to the materials used to package products intended for human consumption, including food items sold at the supermarket and items prepared at fast food restaurants. Packaged food items sold at the market include products such as frozen foods, canned goods, bottled goods, meats and poultry, and numerous other products. Fast food generally refers to those food items that are prepared and packaged at "take out" restaurants. Fast food packaging usually comes into direct contact with the food item and is usually designed to function as a serving device and a carrying container. The basic purpose of the carrying container is to insulate the food item during transport. Most fast food packaging materials are designed to add little or no cost to the food item being sold.

The following list identifies some of the most common packaging devices used by restaurants, drive-ins, and delicatessens to serve fast foods in Hawaii. These devices and how they relate to the problems, issues, and questions raised in the resolution will be the primary focus of this study.

> **Fast food serving devices:** Styrofoam lunch plates with hinged or snap-on covers; *paper lunch plates with hinged cardboard carrying boxes; plastic rectangular bento* containers with hinged or snap-on covers; plastic or styrofoam soup/stew bowls with snap-on covers; paper or foil hamburger/deli sandwich/hot dog/burrito wrappers; and

miscellaneous plastic, styrofoam, or paper containers for salads, french fries, desserts, condiments, and other items.

Fast food beverage containers: Waxed, laminated paper or plastic cold drink cups with caps; styrofoam hot drink cups with caps; aluminum cans; and glass bottles.

Fast food utensils: Plastic forks, spoons, and knives; wooden chopsticks; plastic or paper straws; paper napkins.

Carrying devices: Plastic or paper bags; cardboard soft drink carrying trays.

Packaging as a Constituent of Municipal Solid Waste

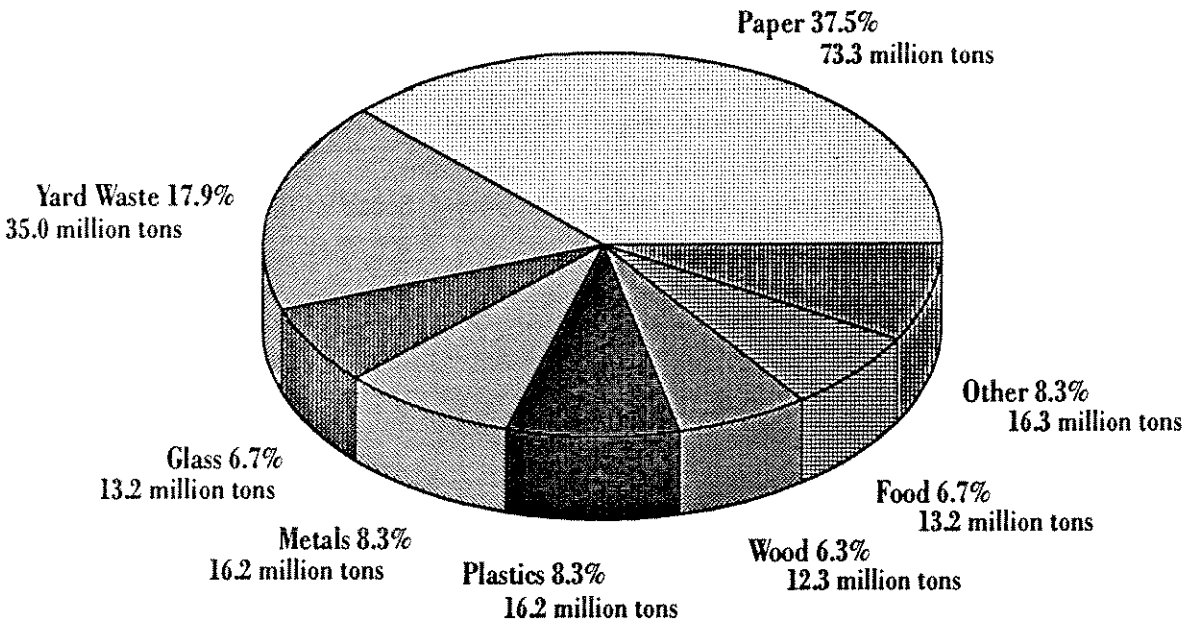
As noted in the previous section, the municipal solid waste stream is composed of many diverse components. While fast food packaging waste is a highly visible component of the waste stream, studies have indicated that the actual amount of waste generated by the food service industry in the United States may not be as overwhelming as it seems. Although the statistic is difficult to verify, one study estimates that the wastes generated by the fast food industry represent only one-quarter-of-one percent (0.25 percent) of all of the solid wastes generated in the United States.[1]

Studies focusing exclusively on this particular constituent of the waste stream are extremely rare. Aside from the statistic cited above, studies typically focus on the broader issues involved in municipal solid waste management. Studies performed by organizations such as the United States Environmental Protection Agency typically analyze the waste stream in terms of the broad categories of materials involved--such as glass, metals, paper, and plastics.

Exhibit 2-1 provides a breakdown of municipal solid wastes in the United States in terms of weight. Note that the categories entitled "paper and paperboard" and "plastics" make up nearly half of all solid wastes by weight in the United States. It is important to emphasize, however, that the sources of these wastes include a wide assortment of products including newspapers, durable plastic goods, and other paper and plastic products.

It is estimated that packaging materials (including food and nonfood packaging materials) account for approximately one-third of all municipal wastes generated in the United States by volume.[2] The percentages of packaging materials in the waste stream by weight in 1986 were: 14.5 percent paper, 7.6 percent glass, 4 percent plastic, 2 percent steel, and 1 percent aluminum.[3]

Exhibit 2-1
Materials generated in Municipal Waste by Weight, in 1990



Source: U.S. EPA, 1992

It is estimated that up to seventy percent of the packaging industry is geared toward the production of food and beverage packaging.[4] It is therefore not unreasonable to suggest that most of the packaging waste generated in the United States originates from packaging involving food and beverages. Unfortunately, no estimates were available on the percentage of packaging products made specifically for use and distribution in fast food applications.

Packaging as a Constituent of Litter in Hawaii

Although litter is a form of solid waste, the materials generally found in litter by no means present a full and accurate profile of the materials that make up the solid waste stream. The term "litter" is generally used to refer to wastes discarded improperly. Because fast food products such as soft drinks, hamburgers, and plate lunches are frequently consumed in areas where waste disposal laws are difficult to enforce, fast food packaging materials often make their way into the waste stream as litter.

Exhibit 2-2 presents the results of a survey conducted by the state Litter Control Office. As noted in the survey, items traditionally associated with fast food packaging (i.e., "Cups, Lids, Straws" and "Other Take out Food Packaging") make up a significant portion of the litter profile on Maui and Oahu.

The amount of fast food litter on the streets tends to exaggerate the amount of fast food wastes actually found in the solid waste stream. As noted earlier, although food packaging is a very visible form of litter, several studies claim that these wastes represent less than one percent of all the wastes generated in the country.

Exhibit 2-2
Comparison of Maui and Oahu Litter Composition

	Percentage of Visible Accumulated Litter		
	Oahu	Maui	All Sites Combined
Convenience Products & Packaging			
Beer & Soft Drink Containers	6.68%	6.00%	6.60%
Juice, Wine, Liquor Containers	.81	.19	.73
Bottle Caps	3.45	5.21	3.67
Pull Tabs	.25	1.88	.45
Carriers, Cartons, Etc.	1.31	.11	1.16
	12.50%	13.39%	12.61%
Cups, Lids, Straws	11.00%	7.20%	10.53%
Candy, Gum, Snacks, Ice Cream	16.12	8.19	15.14
Other Take Out Food Packaging	3.89	4.03	3.91
Napkins, Tissue, Bags, Picnic	13.76	10.91	13.41
	44.77%	30.30%	42.98%
Cigarette, Matches, Tobacco	5.50%	5.03%	5.44%
Toiletries, Clothing, Recreation...	4.53	3.94	4.46
SUBTOTAL	67.29%	52.67%	65.49%
Other Products/Packaging			
Newspaper, Magazines, Books	2.96%	.94%	2.71%
Advertising	2.14	1.21	2.02
Home Food Packaging	1.54	-	1.35
Vehicle Supplies, Debris	2.50	2.11	2.45
Construction Material, Debris	2.88	5.72	3.23
Misc. Paper	6.43	10.90	6.99
Misc. Plastic	9.33	20.81	10.75
Misc. Metal, Foil	2.09	3.21	2.23
Other Wood, Trimmings, Misc.	2.83	2.43	2.78
SUBTOTAL	32.71%	47.33%	34.51%
GRAND TOTAL	100.00%	100.00%	100.00%

Source: Hawaii Litter: 1993 Trends in Visible Litter on Oahu and Maui, Daniel B. Syrek.

ENDNOTES

1. Bill Leonard, HR Magazine, "Food Services Discard Throwaway Image" March 1991, vol. 36, no. 3, p. 37.

2. Nancy Wolf and Ellen Feldman, Plastics America's Packaging Dilemma, 1991 Environmental Action Coalition, p. 15.

3. Ibid., p. 16.

4. Robert F. Testin and Peter J. Vergano, Food Review, "Food Packaging", April-June 1991, vol. 14, no. 2, p. 31.

Chapter 3

HISTORY OF FOOD PACKAGING AND PACKAGING MATERIALS

Introduction

To develop an understanding of the problems that may be caused by food packaging waste in the environment, a basic understanding of the materials that make up food packaging is necessary. This chapter reviews the history of food packaging in the United States and provides a background on plastic--the most controversial material used in modern packaging products.

Background on Food Packaging

Food packaging technology has advanced considerably since mesolithic and neolithic times when baskets of woven grasses and vessels of clay were used to preserve food.[1] Glass jars and small bottles were already in use during Sumerian times, and by 1550 B.C., glassmaking was an important industry in Egypt.[2] Tinplate technology, which enabled the fabrication of metal canisters from thin sheets of lead, zinc, and copper, was developed in 1200 A.D.[3] By the mid 1600s, tobacco, tea, and various medicinal goods were being sold by *manufacturers in sealed paper packages.* The first cylindrical tinplate can was designed in 1810, and the first method of extracting aluminum was developed in 1825.[4] Packaging technology, and the entire industrialized world in general, was revolutionized in 1868 when John Wesley Hyatt mixed pyroxylin with camphor to create celluloid--the first synthetically developed plastic compound.[5]

Over the past century, improvements in food packaging provided the technology necessary to transform the nation's local and regional food distribution system into a national and global network. Perennial access to seasonal or otherwise perishable food items became possible and the growing surplus of food supplies in the city centers of each region further hastened the country's transition from a rural to an urban society.

Today, the packaging industry in the United States (including food and nonfood packaging) generates revenues of $70 billion per year.[6] Experts estimate that fifty-five to seventy percent of packaging *manufactured in the United States is for food and beverage* products.[7] The implications of a world without food packaging can be clearly illustrated by contrasting the food spoilage rates of the developed nations of the world with those of the Third World. In countries where food packaging is minimal or nonexistent, food losses of thirty to fifty percent are not uncommon; whereas in the United States, packaged food losses are less than three percent.[8] Food packaging serves as a barrier against the effects of sunlight, moisture, dehydration, and temperature extremes and mitigates the damage and contamination caused by pests and disease agents such as rodents, insects, and bacteria. Modern food packages also enable manufacturers to promote their products and display basic

consumer information such as nutritional data, directions for use, and evidence of adulteration.

Although the amount of packaging waste discarded by consumers on a daily basis promotes the impression of excessiveness in packaging design, packaging manufacturers frequently point to the fact that packaging can actually reduce the amount of waste generated by consumers:

> Food packaging can reduce waste. For example, a pod of fresh peas is 62 percent inedible. In order to get a pound of fresh peas, about 2.6 pound of peas and pods would have to be purchased, resulting in 1.6 pounds of discarded pods. However, buying 1 pound of frozen peas leaves the customer with only a 1-ounce plastic pouch to dispose of. The pods of frozen peas remain at the food proccessor where they are turned into recyclable by-products such as animal feed. In New York City alone, consuming packaged vegetables annually eliminates the need to dispose of over 100,000 tons of fresh produce waste.[9]

According to packaging designers, the waste reduction benefits illustrated in the foregoing example can be applied to a wide range of other packaged goods as well. Nevertheless, given the heightened focus placed on issues affecting the environment, packaging designs that seem excessive or appear to impact the environment in a negative manner seldom escape the negative publicity of campaigns organized by environmental groups to pressure manufacturers into altering their designs. Two recent changes in packaging design prompted by public pressure include the phase-out of the large plastic container used to package and display compact disc recordings and the replacement of the McDonald's clamshell with a quilted paper wrapper in response to concerns over the environmental effects of styrofoam.

Although food packaging manufacturers rely on a wide variety of natural as well as synthetic materials to manufacture their products, no other packaging material appears to provoke more public concern than plastic. Plastic packaging materials have been identified as the culprit behind problems ranging from wildlife endangerment to landfill inundation. To develop an understanding of the problems that may be caused by plastics in the environment, a basic understanding of the various types of plastic used in packaging is necessary. The following section provides a review of the plastic compounds most frequently used as components in food packaging.

Plastics in Packaging

The packaging industry (including food and nonfood packaging) is the largest single user of plastic resins in the United States.[10] Annual use of plastics by the packaging industry in the United States is estimated to exceed one-third of all plastic resins consumed. The use

of plastics in packaging increased from 6.7 billion pounds in 1974 to 12.4 billion pounds in 1984.[11]

Plastic packaging materials are composed of a wide array of resins and resin combinations. Almost all plastic resins are synthesized from fossil fuels--either petroleum, natural gas, or coal.[12] Manufacturers refine, heat, and pressurize these fuels and combine them with catalysts to convert them into simple chemicals called monomers. Examples of monomers include ethylene, propylene, benzene, and toluene. A wide range of chemicals are used in the second stage of the process to combine the simple monomers into complex molecules called polymers. Ethylene is thereby converted into a resin called polyethylene, propylene becomes polypropylene, and styrene becomes polystyrene. Manufacturers control the polymerization process and include a variety of additives to form a diverse array of resins that exhibit very different characteristics and properties.[13]

The Society of the Plastics Industry identifies forty-five basic "families" of plastics, each containing hundreds of variations.[14] These families fall under two broad categories of plastics--"thermoplastics" and "thermosets". Thermoplastics (plastics that can be melted and resolidified repeatedly) comprise 87 per cent of the plastics produced in the United States. Plastics in this category can be recycled although thermoplastic resins may become progressively degraded with each remelting. Thermosets, on the other hand, are plastics that change their characteristics when heated, and therefore, cannot be recycled.[15]

There are seven basic resin types in the category of thermoplastics, each with a unique structure and use in the marketplace. Plastics are used either in rigid form to create bottles, jugs, and containers; or in the form of flexible films to create wraps, grocery bags, and plastic sheets. The Society of the Plastics Industry has developed a universal recycling code to identify the seven basic resin types included in the category of thermoplastics (see Exhibit 3-1).

Polyethylene Terephthalate (PET) is a tough and shatter resistant resin that is generally used to develop products such as juice and soft drink bottles, detergent containers, and bottles for pharmaceutical products. PET is highly recyclable and is easily converted into products such as fiberfill, carpets, and nonfood containers. Currently, 25 percent of all PET bottles and 24 percent of PET packages are recycled.[16]

Exhibit 3-1

Plastic Recycling by Number

= PET (polyethylene terephthalate)

= HDPE (high-density polyethylene)

= PVC (polyvinyl chloride)

= LDPE (low-density polyethylene)

= PP (polypropylene)

= PS (polystyrene)

= Other (including multilayer)

High density polyethylene (HDPE), a tough, flexible, and translucent material, is the most widely used resin in packaging. Products manufactured from HDPE include milk, water, juice, and vinegar jugs; dairy product tubs; detergent and cosmetic containers; and automotive product bottles. HDPE is also used to manufacture several film products such as trash bags and grocery sacks. HDPE film has the feel of paper and makes a crushing sound when wrinkled. HDPE is recyclable and can be converted into products such as motor oil containers and detergent bottles.[17]

Polyvinyl chloride (PVC) is widely used in the development of products such as pipes, plastic siding, gutters, luggage, auto parts, blister packages, shampoo bottles, credit cards, synthetic leather, and various films such as "saran" wrap. PVC is a strong and versatile resin but can be very brittle unless treated with plasticizers. Most PVC products are durable items that do not end up in the municipal waste stream. Recycled PVC can be made into products such as drain pipes and vinyl siding. Currently, less than one percent of all PVC is recycled.[18]

Low Density Polyethylene (LDPE) is a moisture-proof and inert resin that is used mainly to manufacture garbage bags, grocery sacks, and coatings in plastic bottles. LDPE, in contrast to HDPE, has a waxy feel and can be stretched considerably before tearing. LDPE can also be used to manufacture rigid products such as squeeze bottles and milk jugs. Recycled LDPE can be made into products such as trash bags.[19]

Polypropylene (PP) is a durable resin used mainly in the manufacture of products such as battery cases, furniture, screw-on bottle caps, and plastic strapping. PP is generally stiff and is resistant to heat as well as chemicals. The rate of PP recycling has increased dramatically in recent years. More than 95 percent of all battery cases are recycled. Recycled PP can be used to manufacture battery casings, auto parts, and carpets.[20]

Polystyrene (PS), better known by its trade name "styrofoam", is a brittle and rigid resin with outstanding thermal properties. PS is used extensively for fast food packaging, meat and poultry trays, hot cups, egg cartons, insulation, and yogurt cups. PS is also used to produce rigid items such as cassette tape cases, bottles, and disposable razor handles. Recycled PS can be used to produce insulation, office equipment, and plastic trays.[21] PS products gained wide notoriety during the 1980s because of the foaming agent--chlorofluorocarbons (CFCs)--used in the production of PS materials. CFCs were widely used in the production of PS products in the past. In 1988, however, manufacturers of PS food service packaging agreed to phase out the use of CFCs. Pentane, which does not deplete stratospheric ozone, is now used as a substitute for CFCs.[22]

Plastics falling under the category of "other" resins are mainly used for products such as microwaveable serving dishes, juice boxes, snack bags, and squeezable bottles.

ENDNOTES

1. Stanley Sacharow and Roger C. Griffin, Principles of Food Packaging, AVI Publishing Company, 1980, p. 1.
2. Ibid., p. 4.
3. Ibid., p. 6.
4. Ibid., p. 11.
5. Ibid., p. 8.
6. Robert F. Testin and Peter J. Vergano, Food Review, April-June 1991, vol. 14, No. 2, p. 31.
7. Ibid.
8. Ibid.
9. Ibid.
10. Nancy Wolf and Ellen Feldman, Plastics America's Packaging Dilemma, 1991 Environmental Action Coalition, p. 16.
11. Ibid.
12. The League of Women Voters Education Fund, The Plastic Waste Primer, Lyons & Burford Publishers, p. 21.
13. Ibid.
14. Ibid., p. 22.
15. Ibid.
16. Ibid.
17. Ibid.
18. Ibid.
19. Ibid.
20. Ibid.
21. Ibid.
22. Ibid., p. 35.

Chapter 4

BIODEGRADABLE AND RECYCLED-CONTENT PACKAGING AND THE ROLE OF THE FOOD AND DRUG ADMINISTRATION

Introduction

One characteristic common to all thermoplastic resins is durability. While durability is still viewed as a beneficial property of plastic, the characteristic has also become one of the industry's greatest liabilities. The intensity of the effort to create a resin that would somehow deteriorate without a trace upon disposal directly responds to the public belief that such a product can actually be developed. This chapter reviews the progress of research in the area of biodegradable and recycled-content packaging. This chapter also examines the regulatory process involved in the development of biodegradable and recycled-content packaging materials.

Recycled Plastics and the Food and Drug Administration

Plastics can be recycled in many ways. First, excess plastic trim resulting from the manufacturing process can be recycled. The United States Environmental Protection Agency has categorized this type of recycling as "1st degree" recycling.[1] In "2nd degree" recycling, the plastic is physically reprocessed by grinding, washing, pelletizing, or flaking, then remelted to form new containers.[2] In "3rd degree" recycling, the polymers are chemically broken down into monomers or oligomers and are cleaned and used to regenerate new polymers.[3]

While recycled plastic and paper materials are used extensively in nonfood packaging products, their use in food packaging at this time is extremely limited. As noted earlier, because food packaging products come into close or direct contact with the edible items contained within, the precautions exercised in the manufacture of food packaging products are considerably higher than those exercised in the production of packaging materials for nonfood uses. The agency in charge of establishing and enforcing food safety standards nationwide is the federal Food and Drug Administration (FDA).

Under the federal Food, Drug, and Cosmetic Act, the FDA is mandated to ensure that all products within its oversight are wholesome, safe, and effective.[4] Since the passage of the Food Additive Amendment in 1958, the FDA also has had the authority to regulate all materials that come into contact with food. Under the amendments, no food additive (including the packaging that comes into contact with the food) may be marketed without a regulation governing its use.[5]

Concerns over chemicals, toxins, flavors, odors, and other contaminants migrating from the food wrapper into the food item arose long before biodegradable or recycled-content

packaging materials were ever considered for use in food packaging. The FDA examines all types of food packaging and monitors every stage of their use--whether the packaging is used to transport the item from the food processor to the market or from the market to the home; and whether the product is intended to ensure the freshness of the item in the pantry or enable its preparation in a microwave oven.[6]

Food wrappers and containers are often placed in direct contact with food items for long periods of time. Over time, certain food items may interact with these materials taking on an odor or flavor characteristic of the packaging material. In addition, contaminants may migrate from the packaging to the food product--sometimes at levels considered unsafe. The problem of migration is especially acute when the food item contains high levels of acid, fat, or moisture. For example, contaminants from plastic packaging materials have been found to migrate into meats, poultry, cheeses, and other goods.[7] This problem surfaced in 1990 when an unusual odor was detected in a shipment of meat.[8] Tests revealed the presence of benzene (transferred from the packaging material to the raw meat) at levels ranging from five to eighteen parts per billion.[9]

The phenomena of chemical migration also works in reverse. The problem of "flavor scalping" occurs when a package or a container absorbs the flavor of the food product contained within.[10] For example, certain plastic containers absorb the flavor and smell of products such as orange juice. The exchange may occur to the extent where the taste of the product is noticeably altered or diluted. In addition, the container may retain the color and smell of the product even after repeated attempts to flush out the contaminants.[11]

Packaging manufacturers are required under federal regulations to obtain the approval of the FDA before any new material is incorporated into a food packaging product.[12] It is the responsibility of the manufacturer to explore the possibility that the packaging product may expose the food item to any prohibited substance or contaminant. Materials that release substances or contaminants that cause any illness to humans or animals cannot be used in a food packaging product.[13] After evaluating all data relating to safety and chemical migration, the FDA develops a new regulation for each new packaging material that is approved. The regulation identifies the material as an "indirect food additive" and outlines the conditions for its use. Under the law a "food additive" is defined as a substance that might reasonably be expected to become a component of food through migration from packaging.[14] Packaging materials awarded "prior sanction" on the FDA's "Generally Recognized As Safe" (GRAS) list do not require the approval of a separate regulation. FDA regulations that deal with indirect food additives state that if any packaging material were found to impart any odor or taste upon a food product, the product would be declared adulterated and would therefore be subject to appropriate regulatory action.[15]

The law requires all food packaging manufacturers to abide by a general set of guidelines, including but not limited to: following "Good Manufacturing Practices" principles; using materials only in the amounts necessary; using materials of suitable purity; and avoiding food adulteration.[16] Good Manufacturing Practices dictate that any material, including recycled materials, used in the manufacture of food contact products must be of

suitable purity for its intended use. In essence, recycled materials used in food packaging must be "substantially identical" to the corresponding virgin material authorized under federal law.[17] If the recycled feedstock contains a blend of plastic materials, each polymer, including the blend, must be specifically approved for food contact use.[18]

The suggestion that biodegradable or recycled-content materials be used as components in food packaging has opened a broad new area of regulatory concern for the FDA. While the promoters of biodegradable or recycled-content food packaging products point to the environmental benefits promised by their products, the health implications of these materials in food contact situation remain unclear. With virgin materials, the FDA evaluates safety by reviewing the starting ingredients and the possible byproducts of the manufacturing process.[19] Although quality and purity are easily ensured in the manufacture of virgin packaging materials, these standards may be difficult to guarantee when recycled materials are involved--especially in the case of recycled paper and plastic. Recycled glass and aluminum pose no problem because they are impermeable and the extreme temperatures required to reprocess these materials are so high that most contaminants are driven off.[20] Plastics, on the other hand, are permeable, and the possibility that a contaminant such as a pesticide or motor oil might be absorbed and remain in the resin of a recycled container is a distinct possibility.[21] If the history of a plastic container in its "first life" is not well known, the purity of the reclaimed material cannot be assumed. If a contaminated plastic container enters the manufacturing process, the contaminant could be dispersed throughout the entire recycled resin stock. It is possible that traces of a carcinogenic substance could become a part of the packaging and migrate into the food product at the point of contact.[22]

Although promises of guidelines and regulations have been made by the FDA for several years, no formal procedures to regulate the use of biodegradable materials in food packaging products have been developed by the agency. One of the most controversial questions is whether it is strictly necessary to secure the approval of the FDA for the use of recycled plastics to package food. Although a rather extensive regulatory framework for the use of virgin materials in food packaging already exists, the law is unclear with respect to the use of recycled components in packaging.[23] Currently, the law neither prohibits nor permits the use of recycled materials in food packaging.[24]

While it is unclear whether formal authorization from the FDA is actually necessary, many packaging manufacturers will not go to market with a new packaging product without soliciting the blessing of the agency.[25] The procedure currently followed by the FDA to deal with requests of this nature is an informal system known as the "no objection process".[26] Unfortunately for manufacturers, there are no established time limits on the reviews performed by the FDA. A long FDA review may mean substantial delays in the release of a new packaging product on the market. The procedure begins with the submittal of product information and a petition by the manufacturer requesting an evaluation by the FDA. The FDA evaluates the entire process, including the source of the feedstock and procedures such as sorting, washing, and temperature conditions. If the FDA finds no reason to prohibit the

use of the recycled materials in the food packaging product, the agency will issue a "no objection" letter.[27]

Thus far, "no objection" letters have been issued by the FDA for a narrow selection of food packaging products, including polystyrene egg cartons and polyethylene berry baskets.[28] Researchers emphasize, however, that the FDA's decision to authorize the use of recycled plastics for the aforementioned purposes was heavily influenced by the fact that most consumers wash their fruits prior to consumption and the fact that eggs are equipped with a natural barrier to protect against direct contamination.[29] The FDA has also sanctioned the use of recycled plastics in the manufacture of supermarket grocery bags. The FDA noted that most foods placed in grocery bags at the supermarket are packaged individually, virtually eliminating the chance of contamination. The agency also noted that although items such as fruits and fresh produce frequently come into direct contact with grocery bags, the period of exposure is usually brief. The agency further noted that unpackaged items, such as fruits, are usually washed prior to use.[30]

Biodegradable Packaging Materials

In the early 1990s, a group of archaeologists from the University of Arizona's Garbage Project began an excavation at the Fresh Kills landfill in Staten Island, New York.[31] The landfill, which began in 1948 as a public works project to fill up unusable marshland, now represents the largest operating municipal solid waste disposal site in the world.[32] Sorting through the garbage and debris retrieved from borings as deep as thirty-five feet, the crew uncovered items such as hot dogs, bread, grass clippings, and newspapers dating back to 1984 in "fairly well preserved" condition.[33]

The popular notion behind biodegradable plastics technology is that organic substances, such as corn starch, incorporated into the material of the packaging product would slowly enable microbes to break down the entire product into simple molecules such as carbon dioxide and water. The idea is that if plastics could be broken down by microbes (biodegradable) or by sunlight (photodegradable) they would present less of a problem to the country's overflowing landfills and the environment. However, as research projects such as the Arizona Garbage Project have demonstrated, even the most degradable of products often fail to deteriorate significantly in the anaerobic conditions of modern landfills.

One of the earliest ventures into the field of biodegradable materials marketing and development was undertaken by Mobil Chemical Company--the makers of Hefty Trash Bags.[34] After years of pressure from consumers to create a product that would cause less harm to the environment, Mobil introduced a biodegradable version of its trash bag in 1989. Consumers were enthusiastic at first and the garbage bags quickly found a market. Each box proclaimed that the trash bags were degradable if exposed to open air and sunlight. Mobil claimed that a ferrous-oxide additive caused the bags to fall apart in the sunlight.[35]

Researchers have since determined, however, that over ninety percent of the materials discarded in landfills are entombed in areas below the surface--essentially devoid of oxygen, light, and moisture.[36] Tests of the new product determined that even in the most ideal conditions, the plastic merely weakened or broke into small pieces. In addition, the trash bags did not degrade in seawater.[37]

Within six months, the Environmental Defense Fund called for a national boycott of the bags and Minnesota Attorney General Hubert Humphrey III sued the company for false advertising.[38] Shortly thereafter, five other states, including New York, joined the suit. The Commissioner of Consumer Affairs for New York City accused the company of perpetrating "green collar fraud". By that time, Mobil removed all environmental claims from its product.[39]

The Wall Street Journal recently described the effort to manufacture biodegradable products as a "field littered with failures".[40] Indeed, the technology has experienced several setbacks in recent years. One major setback was the recent demise of Novon, a division of Warner Lambert Company, whose products included biodegradable trash bags, golf tees, and packing peanuts.[41] In 1993, the Warner Lambert division was forced out of business after spending over $60 million and holding most of the patents on biodegradable technology. Novon products were made through a mechanical process using corn starch and various synthetic materials. A Rockford, Illinois plant capable of manufacturing one hundred million pounds of Novon products each year produced only a trickle because there was so little demand. One of the reasons for the demise of the company was the high cost of producing the biodegradable materials.[42] Reports at the time indicated that most biodegradable products, ranged in price from $2 to $3 per pound, compared to about 50 cents per pound for products developed from ordinary plastic compounds.

Despite these and several other highly publicized failures, research into biodegradable plastics continues for several very special niche markets. For example, the United States Navy is interested in developing biodegradable packaging products because of the refuse disposal problems faced by ships while out to sea for extended periods of time.[43] The Navy has approximately four years to comply with a United Nations treaty that bans the dumping of plastics into the ocean. Several ocean trawling operations are also interested in developing biodegradable fishing nets that, theoretically, would eventually disappear when they are released or snagged on the ocean bottom.[44]

Currently, Ampacet Company, Dow Chemical, Plastigone, Poly-Tech Inc., and Dupont claim to have engineered plastics that are photodegradable.[45] Hobbs & Hopkins developed a trash bag made completely out of cellulose which will degrade given adequate moisture and oxygen. ICI Americas has developed a polymer created from the byproducts of microbes feeding on sugars. The price of the ICI polymer, however, ran as high as $9 per pound in 1991.[46]

According to most experts in the field, biodegradable plastics will not play a significant role in solving the solid waste management crisis. The United States Environmental Protection Agency said that biodegradable plastics do not reduce the volume or toxicity of

solid waste.[47] Biodegradable plastics do not degrade completely and because they are less durable than their synthetic counterparts, more plastic is often used.[48] In addition, biodegradable plastics also could derail efforts to encourage source reduction and prevent littering by giving the public the false impression that plastic disposal is no longer a problem. Finally, biodegradable plastics cannot be recycled. It is likely that an entirely separate recycling process would have to be created to deal with plastics containing degradable materials.[49]

Only a few plastics have proven to be truly degradable; these plastics are extremely expensive and are limited to specific uses such as surgical thread and root coverings for tree seedlings.[50] Most experts consider the possibility of developing a safe, functional, cost-effective, and truly biodegradable packaging material in the near future to be extremely remote.

ENDNOTES

1. Helen R. Thorsheim and David J. Armstrong, CHEMTECH, "Recycled Plastics for Food Packaging", August 1993, p. 55.

2. Ibid.

3. Ibid., p. 56.

4. Ibid., p. 55.

5. Ibid.

6. Judith Foulke, FDA Consumer, "What Happens if the Packaging Gets into the Food ?", November 1991, Vol. 25, No. 9, p. 9.

7. Ibid., p. 10.

8. Beatrice Trum Hunter, Consumers' Research Magazine, "Food for Thought", December 1993, vol. 76, no. 12, p. 8.

9. Ibid.

10. Foulke, supra note 6, p. 10.

11. Ibid.

12. Ibid., p. 9.

13. Ibid.

14. Eric F. Greenburg, Packaging Digest, "Recycled, Fine. But for Packaging Food, Yikes!" October 1991, vol. 28, no. 11, p. 22.

15. Foulke, supra note 6, p. 9.

16. Thorsheim, supra note 1, p. 56.

17. Ibid.

18. Ibid.

19. Ibid.

20. Ibid., p. 55.

21. Ibid., p. 56.

22. Ibid.

23. Greenburg, supra note 14, p. 22.

24. Ibid.

25. Ibid.

26. Ibid.

27. Ibid.

28. Foulke, supra note 6, p. 11.

29. Ibid.

30. Thorsheim, supra note 1, p. 57.

31. William Rathje and Cullen Murphy, Rubbish! the Archaeology of Garbage, Harper Collins Publishers, p. 3.

32. Ibid., p. 4.

33. Ibid., p. 8.

34. Jaclyn Fierman, Fortune, June 3, 1991, vol. 123, no. 11, p. 91.

35. Ibid.

36. Ibid.

37. Ibid.

38. Ibid., p. 92.

39. Ibid.

40. Scott Kilman, "Bioplastic Tries to Come Back on Small Scale", The Wall Street Journal, March 23, 1994, p. B-1.

41. Ibid.

42. Ibid.

43. Ibid.

44. Ibid.

45. Nancy Wolf and Ellen Feldman, Plastics America's Packaging Dilemma, 1991 Environmental Action Coalition, p. 87.

46. Ibid.

47. The League of Women Voters Education Fund, The Plastic Waste Primer, Lyons & Burford Publishers, p. 26.

48. Ibid.

49. Ibid.

50. Ibid.

Chapter 5

BIODEGRADABLE AND RECYCLED-CONTENT PACKAGING REQUIREMENTS IN OTHER JURISDICTIONS

Introduction

In light of the problems forecasted for near-capacity landfills across the country, state and local legislatures have lurched into action by creating a diverse and often contradictory selection of standards aimed at reducing the flow of wastes into the solid waste stream. The absence of federal environmental standards for packaging materials has contributed to the piecemeal approach taken by state and local jurisdictions to address the problem. Needless to say, the patchwork of inconsistent laws, standards, and regulations presents a difficult situation for the distributors of all types of packaged products--especially those involved in the distribution of products nationwide.

Waste reduction programs operating at the state and local level typically focus on broad categories of wastes in the solid waste stream and establish incentives to promote their reuse in beneficial applications such as composting, recycling, or garbage-to-energy generation. Other programs attempt to establish markets for post-consumer wastes such as plastic and glass by encouraging their reuse in projects such as road and building construction. Less typical are programs that ban the use of certain problematic materials in the waste stream and mandate the use of "biodegradable" materials on the belief that such materials would resolve the solid waste crisis.

As requested by the resolution, this chapter examines the biodegradable packaging requirements allegedly being enforced in the states of Washington and New York. This chapter also provides a review of some of the voluntary waste reduction efforts being implemented by several leading food service organizations in the United States.

Suffolk County, New York

In 1988, the Suffolk County Legislature passed legislation prohibiting the use of plastic carry-out containers, polystyrene clamshells for hamburgers, styrofoam coffee cups, plastic utensils, and plastic grocery bags within the Long Island, New York county.[1] The ordinance, which required all food containers to exhibit biodegradable properties, was heralded by environmentalists, upon its approval, as a model for adoption nationwide.[2]

Enthusiasm over the new ordinance quickly eroded, however, as the effective date of the law was repeatedly postponed by the eighteen-member legislature due to the inability of local fast food chains, delicatessens, and retail food stores to find suitable packaging alternatives that met the stringent standards of the law.[3] Compounding the problem was a lawsuit filed by the plastics industry challenging the ordinance on the premise that the

legislature failed to examine the tradeoffs of using more paper and other packaging substitutes in the county. The suit filed by the plastics industry prevailed in two courts, but was dismissed in 1991 on purely procedural grounds.[4]

Support for the ordinance was also undermined by one of the deepest recessions to hit the New York county in decades. Concern over the burdens of government and about policies that added to the cost of business in the county became an even greater consideration.[5] Implying that the law was unfair as well as costly to business, a representative of a local grocery company complained that the food service industry had been "singled out" as the only sector of the economy required to abide by the provisions of the ban.[6] Commenting on the declining popularity of the plastics ban, the New York Times reported in 1994 that the ordinance had become "an embarrassment even to many environmentalists, who (began to) accept that plastics, when compacted in a landfill, are not much worse than paper".[7]

Six years after the passage of the plastics ban, the Suffolk County Legislature began proceedings aimed at repealing the controversial ordinance. On March 6, 1994, the legislature adopted, by a vote of eleven to seven, an amendment repealing the ordinance and establishing a program to encourage the separation of recyclable materials at the source of generation.[8] The new ordinance encourages consumers to place plastic waste into separate barrels so the waste could be reused to make plastic shopping bags and other nonfood contact products. The ordinance also encourages towns and villages to create dropoff sites for polystyrene materials that residents separate from their garbage.[9]

Although the ordinance mandating the use of biodegradable food packaging failed to withstand the basic test of practicality, supporters of the effort credit the program with forcing the plastics industry and fast food corporations to address various long-neglected environmental concerns. The backers of the ordinance claimed that the ban forced McDonald's to abandon the polystyrene clamshell and opt for laminated wrappers and recycled paper sacks.[10]

State of Washington

According to the Washington State Department of Ecology, the State of Washington does not have and never has had a law requiring local food service organizations to use biodegradable or recycled-content packaging materials.[11] In fact, the Washington State Legislature, in 1989, passed a law prohibiting the passage of such requirements by any of the 39 counties and 265 cities that make up the State of Washington.[12]

Apparently in reaction to the fears generated by reports of near-capacity landfills and the earth's thinning ozone layer, several Washington county legislatures, in 1989, began adopting ordinances banning the distribution and use of certain packaging products--particularly styrofoam--within their jurisdictions. Within the Washington business community, however, the growing patchwork of bans and inconsistent packaging ordinances throughout

the state generated visions of a highly chaotic business climate in the state. According to the Department of Ecology, the specter of 39 county and 265 city ordinances prohibiting one type of packaging material or another motivated the Washington State Legislature to pass a "ban on bans"--essentially, a state law prohibiting local and regional legislatures from establishing bans or individual standards for packaging materials within their jurisdictions.[13]

In 1989, the Washington State Legislature passed the "Waste-Not Washington Act", an omnibus measure establishing uniform requirements for the management of solid waste throughout the State of Washington. Among its many provisions is a section relating to packaging materials. Section 70.95C.100(1) of the Revised Code of Washington, which establishes the so-called "ban on bans", reads as follows:

> (1) After April 1, 1989, the state preempts the field of imposing prohibitions on the sale or distribution of products and product packaging for the purpose of affecting the disposal of the product or product packaging. The state shall have exclusive authority to impose such prohibitions or bans. No local or regional subdivision of the state shall have the authority to impose such a prohibition or ban on products or product packaging unless specifically granted such authority by the state legislature. This section shall not apply to an ordinance or resolution adopted prior to April 1, 1989.

Instead of banning packaging products such as styrofoam throughout the state, the Waste-Not Washington Act establishes reasonable programs and incentives for solid waste reduction and recycling. Section 70.95C.090 of the law establishes a "Product Packaging Task Force" to investigate and evaluate methods that would:

> (a) Reduce the volume or weight, or both, of product packaging entering the waste stream;
> (b) Reduce the toxicity of packaging entering the waste stream.
> (c) Reduce the reliance on single use, disposable packaging;
> (d) Increase product packaging recycling; and
> (e) Increase public awareness of the contribution of packaging to the solid waste problem.

The law also establishes a Solid Waste Advisory Committee; a Clean Washington Center; and an Office of Waste Reduction to assist the Department of Ecology in implementing the law. The law requires each county and city of the state to adopt comprehensive solid waste management plans. The law also establishes programs and requirements for solid and hazardous waste disposal, used motor vehicle tires, solid waste incinerators, municipal landfills, lead-acid batteries, and the composting of food and yard wastes.

Voluntary Efforts of National Food Service Organizations

The public's enthusiasm toward environmental cleanup campaigns during the 1980s had companies scrambling to develop new and innovative ways to demonstrate their environmental ethic. While "being green" has almost become a universal aspiration among American corporations, several of the earlier bouts between environmentalists and the business sector were hard fought. One of the earliest confrontations between environmentalists and the food service industry centered on the type of materials used by fast food giant McDonald's to package their most famous product--the Big Mac hamburger.

At the request of environmental groups, McDonald's, in the mid 1970s, abandoned the thick paperboard material used to package its hamburgers and switched to a new and innovative food packaging concept--the styrofoam clamshell.[14] The clamshell was durable, lightweight, non-toxic, and excellent at preserving heat as well as trees. Support for the product quickly faded, however, when reports of near-capacity landfills and holes in the ozone began circulating in the mid 1980s.[15] Under pressure to change once again, McDonald's decided to phase-out the clamshell and phase-in a new quilted paper alternative that preserved heat.[16]

To develop a sense of order with the environmental community, McDonald's agreed to work with the Environmental Defense Fund (EDF), a national advocacy group, to put together a plan for recycling and cutting waste.[17] Recognizing McDonald's stature as an industry leader, the EDF began working with the food service organization and recommended the development of a joint task force. The goal of the task force was to reduce the amount of solid waste generated while maintaining the company's high-volume and quick service standards. In April 1991, McDonald's announced forty-two initiatives aimed at source reduction, reuse, recycling and composting.[18]

The goal was to reduce the amount of waste generated by the food service organization's 8,500 restaurants by 80 percent.[19] The report of the joint task force also produced a corporate-wide environmental policy focusing on waste reduction. The waste reduction plan included initiatives such as changes in packaging design, the use of recycled materials, the use of unbleached materials, and expanded composting and recycling programs. Finally, the task force identified a set of mechanisms to incorporate the waste reduction goals and objectives into the standard operating procedures of the food service chain.[20]

McDonald's also started McRecycle--an initiative designed to create a market for recyclable products.[21] Under the program, McDonald's promised to spend $100 million on products made from recycled materials to build and equip its restaurants. Other environmental programs include employee orientation and courses on environmental awareness.[22]

Because of its stature in the business world, McDonald's received most of the attention in the media, but many other restaurants are changing too. Arby's, an Atlanta-

based fast food chain specializing in roast beef sandwiches dropped the styrofoam clamshell in 1991, but not because of negative publicity.[23] A survey conducted by the chain found that foam clamshells and foil wrappers were equally acceptable to customers. While the foil was not recyclable, it was less costly than the styrofoam clamshell and took up less space in landfills. To further demonstrate its commitment to the environment, the chain also began working on a method to recycle the foil on the packaging by burning off the paper backing. Arby's has also switched from foam to paper coffee cups in jurisdictions (such as Portland, Oregon) where polystyrene products are prohibited by law.[24]

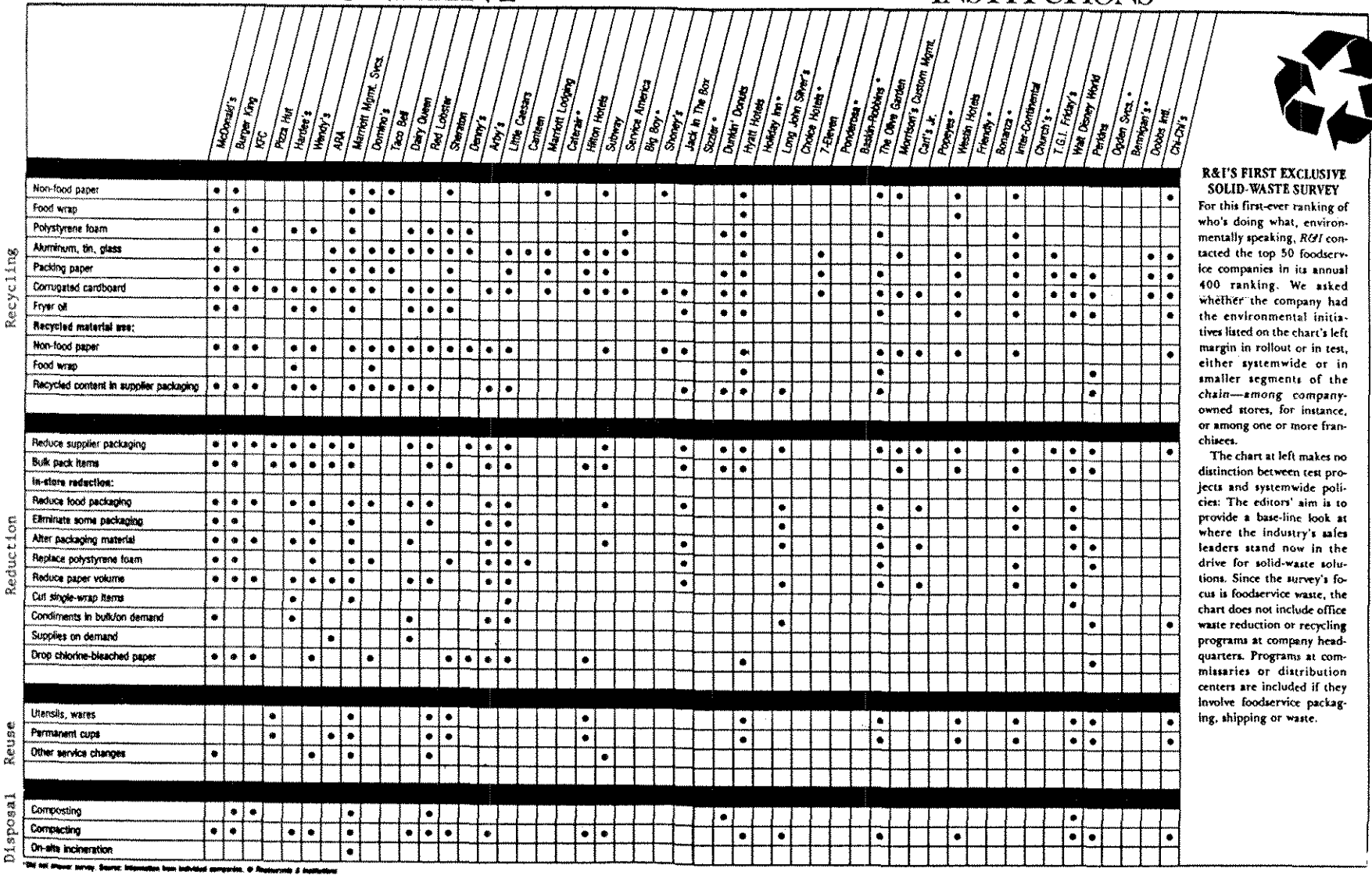
Kentucky Fried Chicken and Burger King began examining the feasibility of composting their waste products in 1991.[25] Pilot programs were established by both organizations in several parts of the country to devise a workable method of composting. According to a report compiled for Kentucky Fried Chicken, as much as eighty-six percent of each unit's waste is compostable. Burger King also became involved in a Michigan State University project studying the applications of compost.[26]

Burger King also began looking into methods of reducing the amount of disposable packaging used by customers who choose to dine on the premises. During a project conducted at a unit in its corporate headquarters, customers received their meals in a reuseable plastic container. The container eliminated the need to serve the food items in a paper clamshell that had a functional life of approximately five minutes. However, because most fast food restaurants lack full tableware washing facilities, making the transition to permanent tableware may present problems. In addition, tradeoffs such as increased water use make the permanent tableware option less attractive.[27]

In 1991, Restaurants and Institutions, a trade publication of the food service industry, conducted a survey of the top fifty restaurant chains in its annual ranking to determine "who's doing what" in the area of environmental protection.[28] (See exhibit 5-1) According to the publication, the survey's aim was to provide a "baseline look at where the industry's sales leaders now stand in the drive for solid waste solutions." The survey does not make a distinction between test projects and established standard operating procedures. The survey also notes that since the report focuses on food service waste, programs to reduce or recycle office waste are not included.[29]

Exhibit 5-1

ENVIRONMENT & RESTAURANTS INSTITUTIONS



*Did not answer survey. Source: Information from individual companies. © Restaurants & Institutions

R&I'S FIRST EXCLUSIVE SOLID-WASTE SURVEY

For this first-ever ranking of who's doing what, environmentally speaking, *R&I* contacted the top 50 foodservice companies in its annual 400 ranking. We asked whether the company had the environmental initiatives listed on the chart's left margin in rollout or in test, either systemwide or in smaller segments of the *chain*—among company-owned stores, for instance, or among one or more franchisees.

The chart at left makes no distinction between test projects and systemwide policies: The editors' aim is to provide a base-line look at where the industry's sales leaders stand now in the drive for solid-waste solutions. Since the survey's focus is foodservice waste, the chart does not include office waste reduction or recycling programs at company headquarters. Programs at commissaries or distribution centers are included if they involve foodservice packaging, shipping or waste.

ENDNOTES

1. Geoffrey M. Levy, Packaging in the Environment, Chapman and Hall, (1993), p. 78.
2. New York Times, "Suffolk Legislators Drop Ban on Plastic Packaging for Foods", March 9, 1994, p. B-1.
3. Ibid.
4. Levy, supra note 1, p. 78.
5. New York Times, supra note 3.
6. Ibid., p. B-34.
7. Ibid., p. B-1.
8. Ibid.
9. Ibid., p. B-34.
10. Ibid.
11. Telephone interview with Brad Everson, Washington State Department of Ecology, September 11, 1994.
12. Ibid.
13. Ibid.
14. S. Jackie Prince and Richard A. Denison, "Launching an New Business Ethic: The Environment as a Standard Operating Procedure", Industrial Management, November-December 1992, vol. 34, no. 6, p. 15.
15. Jaclyn Fierman, "The Big Muddle in Green Marketing", Fortune, June 3, 1991, vol. 123, no. 11, p. 91."
16. Ibid.
17. Prince, supra note 14.
18. Ibid., p. 16.
19. Ibid.
20. Ibid.
21. Bill Leonard, "Food Services Discard Throwaway Image", HR Magazine, March 1991, vol. 36, no. 3, p. 37.
22. Ibid.
23. Rob Townsend, "Chains Rethink Packaging with Environment in Mind", Restaurants & Institutions, March 6, 1991, vol. 101, no. 6, p. 105.
24. Ibid.
25. Ibid., p. 110.

26. Ibid.

27. Ibid.

28. Brian Quinton and Jeff Weinstein, "Who's Leading the Green Revolution", Restaurants & Institutions. November 27, 1991, vol. 101, no. 30, p. 32.

29. Ibid.

Chapter 6

CONCLUSION

> Such bans, (i.e., bans on polystyrene, etc.) although well intentioned, are sometimes predicated on misinformation about the contribution of various products and materials to the solid waste stream, and fallacious assumptions about the value of particular attributes, such as degradability or recyclability, in solving the solid waste problem.[1]

Introduction

H.R. No. 376, H.D. 2, requests the Legislative Reference Bureau to determine the feasibility of requiring local "take out" food service organizations to utilize biodegradable or recycled-content materials to package all fast food items manufactured and sold in Hawaii. The resolution also requests the Bureau to examine the laws of the states of New York and Washington to "determine the extent to which biodegradable and recycled packaging has been studied or placed in use in those states". The Bureau is further directed to "specify the means by which each biodegradable packaging material...will degrade, and the type of facility that will promote or hinder degradation".

Review of Claims and Assertions Made In H.R. No. 376, H.D. 2.

As noted in chapter one, the resolution identifies various problems and makes numerous assertions about the issue of fast food packaging waste in Hawaii. The resolution develops several arguments in support of the use of biodegradable or recycled-content packaging materials in fast food packaging. This section reviews the major claims made in the resolution.

(1) Disposable "take-out" food containers are becoming a "serious contributor to the problem of solid waste" in Hawaii.

The high percentage of fast food waste found in litter on the streets of the State promotes the illusion of landfills overflowing with styrofoam coffee cups, paper lunch plates, plastic forks, laminated soft drink cups, and plastic straws. However, various studies have indicated that the amount of solid wastes generated by the fast food industry may not be as overwhelming as it seems. One study estimated that wastes generated by the fast food industry represents approximately 0.25 percent of all the solid wastes generated in the United States. While the problem is by no means insignificant, it is important to view the issue in its proper perspective.

Over the past decade, the food service industry has made impressive progress in reducing the amount of materials used in packaging their fast food products. Although it is possible that further packaging reductions can be achieved in specific areas by individual food service operations, it is difficult to identify broad or industry-wide recommendations to achieve further packaging reductions. Most restaurants package and serve their fast food items in the barest amount of packaging possible. Further reductions in packaging would probably begin to inconvenience the customer. Additional packaging reductions would perhaps be achieved best on a case-by-case basis.

(2) Fast food containers are made out of "nonrenewable resources" and are "made of materials that are not readily recyclable".

Although it is true that fast food packaging contains materials that are made out of "nonrenewable" fossil fuel resources, the same can be said about any other product that uses plastic. The resolution implies that using "nonrenewable resources" for the manufacture of fast food packaging is wasteful, and that switching to other materials would conserve fossil fuel resources. It should be emphasized, however, that food packaging represents only one of many uses of plastics. Prohibiting this particular use of plastics in Hawaii will not significantly extend the life of the world's supply of fossil fuels.

While the concern to conserve "nonrenewable resources" is understandable, the only practical alternative to plastics in fast food packaging is paper. Switching to a "renewable" resource such as paper may address some of the concerns over fossil fuel depletion, but will give rise to a whole new set of concerns over the destruction of forests and trees. In fact, public concern over the use of paper and cardboard products by the fast food industry led McDonald's to switch to styrofoam packaging in the 1970s.

The resolution also claims that plastic fast food packaging materials are difficult to recycle. Although it is true that certain plastics are difficult to recycle, it should be noted that most materials--plastic or otherwise--that have been contaminated with certain food materials are difficult to recycle. Switching to a more recyclable form of plastic may improve recycling, but food contamination will continue to present problems to recyclers. On the other hand, switching to biodegradable packaging materials will make recycling almost impossible. Biodegradable plastics often contain organic compounds that can destroy entire batches of recyclable plastics. Switching to biodegradable packaging will hinder rather than promote recycling in Hawaii.

(3) Fast food containers, when incinerated, emit "toxic by-products such as chlorofluorocarbons (CFCs)".

In response to reports of atmospheric ozone depletion in certain areas of the world in the 1980s, the plastics industry--like most other industries that used the compound in the production process--began searching for suitable alternatives to the use of chlorofluorocarbons (CFC). In the past, CFCs were used as a propellent in aerosol cans, as a refrigerant in air conditioning units, and as a foaming agent in the production of polystyrene.

As noted in the report, however, under the conditions of an international agreement, CFCs are no longer used in the manufacturing process by plastics industry.

While the issue concerning the release of CFCs by polystyrene fast food packaging during incineration appears to be moot, the underlying concern over the release of any type of toxin during incineration should not be disregarded. It is well known that most plastics emit a number of noxious gases and leave a variety of toxic residues when they are incinerated. Once again, however, it is important to note that the fast food industry is not the only industry that uses plastic materials in their products. The solid waste stream contains plastic waste materials from scores of different sources--food packaging is only one source of plastic wastes. The resolution singles out the fast food industry and targets polystyrene as an important source of incinerator air pollution when similar arguments can be made about virtually every type of plastic found in the solid waste stream.

(4) Fast food containers "create litter on Hawaii's roads and highways".

Statistics from the state Litter Control Office indicate that fast food packaging waste does indeed present a serious litter problem in Hawaii. The resolution implies that biodegradable fast food packaging would mitigate the problem of litter throughout the State.

Because fast food products are frequently consumed in parks, at the beach, or in vehicles while on the road, soft drink cups, plastic lids, paper lunch plates, and other fast food packaging debris have become familiar sights in the landscape of many areas in the State. It is important to note, however, that litter is not a function of the persistence or the degradability of materials discarded. Instead, it is more the result of the offender's disregard for the law and the environment. Regardless of the rate at which it deteriorates, trash deposited illegally on the streets of the State presents a serious problem. Changing all fast food packaging to "biodegradable" materials will not solve the litter problem in Hawaii--especially in light of the fact that most of the "biodegradable" materials developed thus far do not degrade at a rate that would reduce--even marginally--the amount of litter found on Hawaii's streets. In fact, experts in the field of litter control and solid waste management note that using "biodegradable" packaging may even exacerbate the litter problem in Hawaii by leading people to believe that proper litter disposal is no longer an important consideration.

(5) "Even when properly disposed" fast food packages "contribute to the premature filling of landfills".

Chapter four notes that most materials buried in the anaerobic conditions of modern sanitary landfills do not deteriorate at a rapid rate, even over significant periods of time. While diminishing landfill space is a growing problem in Hawaii, the answer to the problem does not lie in switching all fast food packaging in the State to biodegradable materials. Hot dogs, loaves of bread, yard wastes, and many other highly perishable items have been found remarkably well preserved after eight to ten years in sanitary landfills. To date, most "biodegradable" products marketed in the United States (i.e., trash bags and six-pack rings) have exhibited only marginal levels of degradability--even under the best of conditions. In

sanitary landfills, these products deteriorate no faster than products made of conventional materials. Switching from plastic to biodegradable fast food packaging in Hawaii will not reduce the amount of solid wastes occupying Hawaii's landfills.

(6) Items in take-out lunches "which are purely decorative, such as plastic ti leaves" add to the "waste and litter problem".

The resolution implies that decorative items such as the plastic ti leaf serve no purpose and should be eliminated. While the plastic ti leaf may be the source of irritation to some people, preparers of local lunches obviously believe that item promotes sales. The item was probably developed as a replacement for traditional but perhaps more seasonal garnishes such as lettuce leaves or parsley. Thus far, environmental problems due to the use of plastic ti leaves in local fast food lunches have not been widely reported in the State. In addition, because of its insignificant size, it is highly unlikely that a ban on plastic ti leaves in local lunches will significantly extend the life of Hawaii's landfills.

Discussion and Findings

While concern toward the environment has certainly become a public priority in recent years, concern over personal health has also risen to unprecedented levels. The idea of using recycled materials of unknown origin or plastics laden with microbes as food packaging may ultimately prove distasteful to consumers. It is unlikely that the public will willingly accept the use of such materials in food packaging if problems relating to sanitation, food contamination, and chemical migration are not fully addressed and resolved.

Packaging manufacturers are currently monitoring consumer demand to determine the type of packaging product the public is willing to accept. Driven by the demand, the industry has channeled considerable sums into the development of packaging products that help the environment. Recycled materials are used almost universally in packages that contain nonfood items; and research into the use of similar materials in food contact situations continues. Nevertheless, even if a new generation of truly degradable materials appears on the horizon, questions relating to the safety of the byproducts generated during degradation should be addressed prior to allowing--much less mandating--their use in food contact situations. Any effort to require the use of such materials in food packaging prior to federal Food and Drug Administration analysis and approval would be grossly premature.

The high cost of developing biodegradable and other alternative materials is also an important factor to consider. Most of the biodegradable products created thus far (i.e., compostable yard trimming bags, starch-based packing materials, and biodegradable golf tees) are far more expensive than products made from conventional materials. Assuming that suitable biodegradable products were actually available for commercial use, any law requiring one sector of the business economy, such as the food service industry, to use these materials would impose an uneven burden on the operations involved in this particular line of business-

-especially in light of all the other businesses and commercial operations that generate plastic wastes in the State.

The problems experienced by other jurisdictions should serve as indicators of the practicality of passing such a requirement in Hawaii. For example, six years after passing an ordinance requiring all food service outlets in the county to use biodegradable food packaging materials, the Suffolk County Legislature was forced to acknowledge the fact that the technology to manufacture a safe, affordable, and truly biodegradable alternative to conventional food packaging did not exist. While the concept is appealing, the technology to bring about zero solid waste generation remains far from reality.

Recommendations

Rather than mandating the use of recycled-content or biodegradable food packaging materials, the Bureau recommends that the Legislature allow the local food service industry to respond to the preferences and the demands of local consumers. Consumer demand across the nation has driven the food service and packaging industries to develop innovative methods of reducing the volume of wastes generated by fast food restaurants. Mandating the use of biodegradable or recycled-content food packaging materials would restrict the options and alternatives available to local fast food restaurants to develop innovative solutions and improve their environmental performance.

The Legislature established agencies such as the state Litter Control Office, the University of Hawaii Environmental Center, the Hazardous and Solid Waste Branch of the Department of Health, and the Clean Hawaii Center to protect the environment, control litter and solid waste, promote recycling, and advise the Legislature on methods of solving these problems. The Legislature should allow these programs to continue to work with all generators of solid waste in the State to develop practical and comprehensive solutions to the problem of solid waste management.

ENDNOTES

1. Geoffrey M. Levy, Packaging in the Environment, Chapman and Hall, (1993), p. 78.

Appendix A

HOUSE OF REPRESENTATIVES
SEVENTEENTH LEGISLATURE, 1994
STATE OF HAWAII

H.R. NO. 376 H.D. 2

HOUSE RESOLUTION

REQUESTING THE LEGISLATIVE REFERENCE BUREAU TO STUDY THE FEASIBILITY OF USING BIODEGRADABLE AND RECYCLED PACKAGING, AND THE DEPARTMENT OF HEALTH TO CONSULT WITH RETAIL FOOD INDUSTRY REPRESENTATIVES ON THE FEASIBILITY OF REDUCING THE OVERALL AMOUNT OF FOOD PACKAGING FOR FOOD ITEMS PRODUCED OR PROCESSED IN THE STATE.

WHEREAS, it is the policy of the State to:

(1) Conserve its natural resources;

(2) Promote optimal use of solid waste; and

(3) Encourage its citizens to be responsible trustees of the environment for the next generation;

and

WHEREAS, Hawaii has a unique natural environment but a finite amount of resources and space that is presently being degraded and will continue to be degraded unless immediate steps are taken to control excessive waste; and

WHEREAS, disposable food packaging, particularly take-out food containers, is becoming a serious contributor to the problem of solid waste, as nonrenewable resources, made of materials which are not readily recyclable, and when incinerated, threaten the natural environment by the introduction of toxic by-products, such as chloroflurocarbons (CFCs), into the atmosphere; and

WHEREAS, disposable food packaging creates litter along Hawaii's highways and roadways, and even when properly disposed of, these containers contribute to the premature filling of landfills; and

WHEREAS, the disposable containers used in the packaging of "bento" take-out lunches and various food items packaged locally also contain plastic items, which are purely decorative (such as plastic ti leaves) and adds to our waste and litter problem; and

WHEREAS, the Legislature recognizes the enormous problem of the disposal of food containers and the potential health hazards of harmful CFCs released during incineration; and

WHEREAS, these problems could be alleviated by the reduction of food packaging, use of recycled food packaging, and use of biodegradable packaging, such as that required or proposed by the states of Washington and New York; now, therefore,

BE IT RESOLVED by the House of Representatives of the Seventeenth Legislature of the State of Hawaii, Regular Session of 1994, that the Legislative Reference Bureau (LRB) is requested to conduct a comprehensive study of cost-effective, biodegradable, and recycled food packaging, and decorative items for food items processed and packaged in Hawaii; and

BE IT FURTHER RESOLVED that LRB consult with the Hawaii Food Industry Association so that it may be a part of the study; and

BE IT FURTHER RESOLVED that LRB contact state officials in the states of Washington and New York to determine the extent to which biodegradable and recycled packaging has been studied or placed in use in those states, and to the extent ascertainable, the impact of such use; and

BE IT FURTHER RESOLVED that LRB specify the means by which each biodegradable packaging material considered will degrade, the average length of time to degrade, and the type of facility that will promote or hinder degradation; and

BE IT FURTHER RESOLVED that the Department of Health (DOH), as the state agency having responsibility to work regularly with retail food establishments to ensure compliance with sanitary regulations, and which has knowledge of the amount and types of food packaging used by these establishments, convene a panel with representative members from the various retail food establishments to:

(1) Meet with LRB to provide input on the feasibility and cost to each type of retail food establishment of using the proposed biodegradable or recycled packaging alternatives; and

(2) Devise practical methods of reducing the overall amount of packaging for foods processed or produced in the State;

and

BE IT FURTHER RESOLVED that the panel be comprised from representative members from the following types of retail food establishments: fine dining, coffee shop, mobile restaurant or lunchwagon, cafeteria, lunchroom, lunch counter, catering kitchen, grocery store, supermarket, public food market, food stand, and if feasible, other establishments or operations in which food is prepared, serviced, or provided to the public for charge; and

BE IT FURTHER RESOLVED that LRB assist DOH in drafting proposed legislation to implement proposals stemming from DOH's consultations with the retail food establishment panel to reduce the volume of packaging for foods processed or produced in the State; and

BE IT FURTHER RESOLVED that LRB report its findings, conclusions, and recommendations to the Legislature no fewer than twenty days prior to the convening of the Regular Session of 1995; and

BE IT FURTHER RESOLVED that DOH report its findings and proposed legislation, if any, to the Legislature no fewer than twenty days prior to the convening of the Regular Session of 1995; and

BE IT FURTHER RESOLVED that certified copies of this Resolution be transmitted to the Director of the Legislative Reference Bureau, the Director of Health, the Chief of the Environmental Health Administration, the Chiefs of the Food and Drug Branch and the Sanitation Branch, and the Coordinator of the Litter Control Office of the Department of Health.