

GENERAL PRACTICES TO MINIMIZE THE HAZARDS OF PLASTIC ON HUMANS AND ANIMALS

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Abstract: Presently, the word has contributed adversely for excessive generation of substantial solid waste, including plastic waste due to the indiscriminate use, handling and disposal. The health hazards of plastic could be from simple nonbiodegradability resulting in harmful effects on humans and livestock. The cattles, particularly stray cattle among the animal population would be more vulnerable to the hazardous impacts resulting from inadvertent consumption of plastic and foreign bodies along with feed or fodder. The responsibility lies with general public as well as the livestock owners to be prudent on the use of plastic to minimize the hazards on human and livestock.

Keywords: Bisphenol, Pthalate, Livestock, Human health.

Introduction

Plastics are not only an issue for our health, but also for the health of plants and animals everywhere. It is very important to identify the hazardous plastic materials surrounding us for proper disposal). In order to identify different plastics, a plastic identification code would be stamped on the final product to indicate what type of resin it contains. The code is displayed as a number inside a triangle of chasing arrows.

1. PET or PETE (polyethylene terephthalate)

This is used for water and soft drink bottles, mouthwash bottles, containers for condiments like nut butters and ketchup and TV dinner trays. PET is considered safe, but it can actually leach the toxic metal antimony, which is used during its manufacture.

2. HDPE (high-density polyethylene)

HDPE is used in butter tubs, milk jugs, juice, household cleaner and shampoo bottles, as well as cereal box liners and grocery bags. It is often considered a low-toxin plastic, but like almost all plastics, it has been found to release *estrogenic chemicals*.

Received April 17, 2020 * Published June 2, 2020 * www.ijset.net

3. PVC (polyvinyl chloride)

It is used in plastic cooking oil bottles, deli and meat wrappers, shrink wrap, sandwich baggies, and plastic “saran” wrap. It is also found in plastic toys, lunch boxes, table cloths and blister packs used to hold medications. It is commonly used to make jewelry and faux-leather purses, shoes and jackets. PVC contains numerous toxic chemicals including lead and phthalate, which could disrupt the endocrine systems of wildlife, causing testicular cancer, genital deformations, low sperm counts and infertility in a number of species, including polar bears, deer, whales, otters, and frogs, among others.

4..LDPE (low-density polyethylene)

This is low-toxin plastic and it is used in bread bags, produce bags, squeezable bottles as well as coated paper milk cartons and hot/cold beverage cups. It can leach estrogenic chemicals.

5. PP (polypropylene)

Polypropylene is used in straws, yogurt containers, and syrup, ketchup, and medicine bottles. It is considered a low-toxin plastic that is tolerant of heat

6.PS (polystyrene)

This is used in egg cartons, disposable plates, cups and bowls, take-out containers, coffee cups, meat trays, packing materials, and more. When heated, polystyrene can release styrene, a suspected nerve toxin and carcinogen. Heating styrofoam or using it for hot foods and beverages makes it leach toxins even more.

HUMAN HEALTH

Plastic contains chemicals or additives to give it certain properties. There is a wide range of additives, but probably the most relevant to ecology and human health are the following:

Bisphenol A is a monomer that is used to make the hard, clear plastic in polycarbonate food and beverage containers, CD cases and many other consumer products. It is an endocrine disruptor and acts like the female hormone oestrogen. It leaches in variable amounts and for different lengths of time, depending on the product and conditions, i.e. it is released more easily at higher temperatures and with changes in acidity. Early development appears to be particularly sensitive to its effects, with a growing body of evidence for associations with chronic disease, including cardiovascular disease and type 2 diabetes and with hormonal changes in adults. Experiments on animals have revealed that Bisphenol A (BPA) causes various impacts on their reproductive systems, as well as increases in body weight and insulin resistance. A major concern is that these adverse effects relate to current disease trends in

human populations, such as increases in prostate cancer, breast cancer, sperm count decreases, miscarriage, obesity and type 2 diabetes.

Phthalates (diesters of 1,2 – benzenedicarboxylic acid) are a group of industrial chemicals used as plasticisers, which make plastics, such as PVC, more flexible or resilient. High-molecular weight phthalates (e.g. di(2-ethylhexyl) phthalate, DEHP) are primarily used as plasticisers, but the low-molecular weight phthalates (e.g. diethyl phthalate, DEP) are used as solvents in personal-care products. This means the sources of phthalates in the environment are numerous. Certain phthalates have been shown to function as endocrine disruptors, and to have anti-androgenic activity. Experimental evidence of negative impacts on reproductive systems of animals and these resemble human reproductive disorders, especially testicular dysgenesis syndrome have been shown, indicating a possible link between phthalate exposure and human disease.

Dioxin emissions: The most dangerous emissions could be caused by burning plastics containing organochlorine-based substances like PVC. When such plastics are burned, harmful quantities of a group of highly toxic chemical called: Dioxins are emitted. Dioxins are carcinogenic and a hormone disruptor and persistent and they accumulate in body-fat and thus. Dioxins also settle on crops and in our waterways where they eventually wind up in the food, accumulate in the bodies and are passed on to generations with fetuses of pregnant mother.

The burning of polystyrene polymers - such as foam cups, meat trays, egg containers - releases styrene. Styrene gas can readily be absorbed through the skin and lungs. At high levels styrene vapor can damage the eyes and mucous membranes. Long term exposure to styrene can affect the central nervous system, causing headaches, fatigue, weakness, and depression.

MEASURES FOR MINIMIZING THE PLASTIC HAZARDS

1. Since plastic is found widely in processed food packaging, the most one can do is to reduce plastic toxins in one's life by changing the diet to include primarily fresh, whole, *unpacked* foods from the farmer's market or food co-op. Buying in bulk or joining a buying club can make this very affordable.
2. Avoiding canned foods and beverages, including canned baby formulas and using BPA-free cans, reusable produce bags to hold and reusable grocery bags to carry all items during shopping and reusable glass or stainless steel water bottles to carry water

3. Avoiding disposable plastic or polystyrene dishes and utensils, Using super cheap mismatched ceramic dishes and stainless steel cutlery are recommended
4. Replacing the plastic kitchenware with items made from stainless steel, glass, ceramic, materials
5. Bringing one's own containers to the restaurant for both carryout and leftovers.
6. Storing shampoo, lotions, liquid soaps, and cosmetics in glass, ceramic or stainless steel containers. Because the toxins in plastic can cause health problems, it is important to avoid containers that leach chemicals like BPA, phthalates, lead and antimony into the food, water and the environment.
7. Using cloth diapers, Choosing glass bottles with real rubber nipples, wood or cloth teethers, etc. and replacing child's plastic lunchbox with a cloth or stainless steel one
8. Choosing wood, cloth, steel and paper-based toys for the children over plastic, whenever possible.
9. For minimizing hazards in livestock, the vegetable waste \kitchen waste should not be disposed off in the plastic bags as the animals are forced to consume the plastic bags along with the vegetable waste.
10. Rearing of the livestock in urban and semi-urban areas near to market places, roadsides are is to be discouraged as they attempt to eat foul and vegetable waste thrown in plastic bags.
11. Dietary impaction is usually encountered in animal fed in straw and poor quality hay with limited water access needs to be addressed and proper balanced ration is to be provided to the animals to reduce\avoid the incidence.
12. Pollution of the grazing lands with plastic bags, hair, hoof, wool, is to be avoided and awareness level among the livestock keepers is to be increased.
13. Farmers \livestock owners should be cautioned against unsupervised grazing of animals as there in danger of accidental ingestion of polythene bags.
14. Providing covered disposal bins for polythene materials separately in municipality areas to avoid ingestion by the animals
15. Popularising the slogan " Not using plastic carry bags when one can carry things in hand" can be another way to avoid the incidence of the problem.

However, in order to follow all the measures to minimize the plastic hazards, one should be having the sincere aptitude towards the protection of the environment and ecosystem.

References

- [1] Bhupendra singh. 2005. Harmful effect of plastic in animals. *The indian cow* oct-dec: 10-18.
- [2] Dodia, V.D., Kelawala, N.H., Sutha D.N. and Prajwalita Sutaria. 2014. Haematological and Serum Biochemical Profile of Cattle affected with plastic foreign bodies. *International Journal of Scientific and Research Publications*,4(8).
- [3] Velappagoundar Ramaswamy and Hardeep Rai Sharma. 2011. Plastic Bags – Threat to Environment and Cattle Health: A Retrospective Study From Gondar City Of Ethiopia. *The Iioab Journal* special issue on environmental management for sustainable development. 2(1); 7-12.
- [4] Vijaya Bhaskara Reddy. M and Sasikala. P. 2012. A Review on foreign bodies with special reference to plastic pollution threat to livestock and environment In Tirupati rural areas. *International Journal of Scientific and Research Publications*, 2(12).