Farm Waste Disposal and its Effect on Human Health

Why has Farm Waste Disposal become so much of a Problem?

Traditional farming practices have been based on the general and sound principle that the farm had a sufficient area of land in proportion to its animal population to absorb the waste produced by those animals. Only rarely--and then over a restricted area--was the land so overloaded that a water-supply was polluted or a fly-nuisance was caused.

In recent years, there has been a rapid change to intensive farming methods by introducing factory farming, this type of farming keep live-stock in intensive units which can be more susceptible to disease than those cultivated in more conventional surroundings. In fact, we are seeing in animals the sort of things known to happen to human beings under crowded conditions, also problem of disposing of vast quantities of waste arises from this type of factory farming.

There are five main reasons why farm waste disposal has become such an important problem in recent years.

1-The population explosion has made "factory farming" a necessity.

2-Less land is available for the grazing of animals and

3- Fewer agricultural workers are left to dispose of the increased effluents efficiently and rapidly.

4- In addition, the Rivers Acts have made it unlawful to discharge farm effluent into a stream without the consent of the River Authority. Such consent is not usually given unless there is some prior purification of the effluent to a required standard.

5- Rivers Acts and Water Resources Act, particularly the latter--give power to the River Authority to control pollution of underground water.

The Direct Effect of Farming on Human Health

Live-stock in intensive units like crowded animal factory, are more prone to disease than those reared in more conventional surroundings. In fact, we are seeing in animals the sort of things known to happen to human beings under crowded conditions.

The spread of disease from animals to man is increasing, owing to modern techniques in animal husbandry and in food processing.

Animal health and human health are closely interrelated because biology is indivisible. Obviously, the more infection present in the animals the greater will be the number of disease carrying organisms to be found in the farm waste. Evidence is consistently being produced to show the dangers to animals, under intensive conditions, of allowing their droppings to accumulate on the site, and in close proximity to their accommodation. Most of the external and internal parasites of animals find accumulations of muck the ideal environment for their continued viability. Many bacteria and some viruses are also able to live for long periods with such a background. This results in an increased number of infected birds or animals reaching the poultry processing plant or a slaughterhouse. Infected carcasses, whether they be poultry or meat may give rise to cases of human food poisoning. The trouble arises from the transfer of infection to working surfaces in the kitchen or to other foods, which will not be subjected to heat treatment in the process of cooking. Although the infected carcass is likely to be sterilized during the cooking process there is very real danger in the case of spit roasting poultry. Owing to inadequate heat penetration spit roasting is sometimes not by itself sufficient to kill such organisms as Salmonella which are the chief cause of food poisoning.

Infectious Diseases

The interrelation of human and animal diseases is probably as old as the origin of man. All micro-organisms are biologically adventuresome in their struggle to survive--they must find a host and as the host range of animal pathogens expands they become a threat to man's well-being. The W.H.O. expert committee on Zoonoses lists more than 100 diseases which are common to man and animals. New disease entities or previously unsuspected human-animal disease relationships are being reported with increasing frequency. It has been established that intensive livestock farming is more likely to cause human disease than the older farming methods especially as many farms were self-contained with sufficient pasture and the stock being brought in only for breeding purposes.

Traditional Farming

Factory Farming

Type of infection diseases in Farming cause health problem to human are:

There are a large number of infection diseases caused by un healthy farms, some of these are

1-Salmonellosis

- The Salmonella group of organisms, of which there are over 1000 serotypes, is the commonest cause of acute food poisoning in man. All members of this group of organisms are pathogenic to man or to animals or to both. The most widely distributed strain of all is S. typhimurium, being promiscuous in its hosts and widespread in its manifestations. It is well known that the excreta (the waste material produced by a body, especially solid waste) of grazing animals can spread intestinal diseases to other members of the group or flock, and that even traditional methods of disposing of farmyard manure or of the effluent from cowsheds and piggeries etc. are not without risk to human health. Generally speaking, there is more risk of the spread of infection with the slurry system (Manure slurry, a mixture of animal waste, organic matter, and sometimes water often known simply as "slurry" in agricultural use, used as fertilizer after ageing in a slurry pit) as compared with the risks involved by normal grazing, or by the conventional method of muck disposal. The slurry system may lead to the excreta being spread onto meadow or fodder crops in a comparatively fresh state instead of being held in the bedding and possibly in a muck heap for several months, before being put onto arable land. It is generally accepted that the climate within such a heap does not favour the continued maintenance or growth of pathological bacteria (Venn, 1968). When cattle graze a pasture that has been fouled by themselves or other cattle they will avoid grazing areas on which dung pats have been deposited, but when slurry is distributed over pastures this selective grazing is no longer possible. Outbreaks of Salmonellosis in cattle where dissemination within the herd has been attributable to slurry have been reported. Jack & Hepper (1968) investigated a herd in Devon where the incidence of Salmonellosis in adult stock was of concern, and they demonstrated the presence of organisms similar to those affecting the cattle, in the slurry tank, the overflow from the tank, and in the pipe from which the slurry was discharged directly onto the pasture. There seems to be little doubt that the spread of the disease in this herd was influenced by organic irrigation with infected slurry. This may well have been aggravated by factors

peculiar to the farm. First, the recommended period during which a field should not be grazed after organic irrigation is 6 months). In this case it was 3 weeks. Second, the entire slurry output had been concentrated on 9 out of 565 possible acres and spread on them at a minimum rate of 20,500 gal per acre in 8 months. The recommended maximum is 15,000 gal per acre per year. No one is yet quite sure as to the survival time of Salmonellae under the conditions of the slurry system, the period is variable according to temperature, humidity, and soil acidity. As a general rule, survival time may be up to 6-12 months or more. Because Salmonellae are pathogenic to man as well as to animals, slurry discharge through the "spray gun" or by means of a "tanker" in the vicinity of housing, presents a serious potential danger to the inhabitants (Osbourne, 1968). It is conceivable that human infection might arise if "spray" containing viable Salmonellae drifted onto a salad crop or fruit crop or onto other food that was taken by mouth uncooked such as unpasteurized milk or milk products.

2- Brucellosis

Brucellosis is one of the most widespread animal diseases that affects man. The number of human infections that occur in the world are estimated in the hundreds of thousands. The highest incidence of human disease is found in Southern Europe, North Africa, Mexico and the Argentine. The Scandinavian countries are free of Brucellosis, and progress is being made in this country (Steele, 1965). The number of new cases of Brucellosis occurring in Britain every year is not known, as Brucellosis is not a notiiiable disease. Infected animals which have recently aborted or given birth to young are the greatest hazards to man. The infectious brucella organisms discharged under these conditions may contaminate the environment to such an extent that animals or man not having direct contact with the infected animals may become infected. When an animal aborts it has been estimated that the products of conception contain some 1 x 10 lz brucella organisms (Keppie et aL, 1961). The viability of the organisms is influenced greatly by the surroundings. They have been shown to survive in faeces at 8 ° C for a year, (Stableforth, 1959) and at room temperature for 120 days (Cameron, 1932), but when exposed to direct sunlight without the protection of adventitious matter, they are destroyed in a few hours (Stableforth, 1959). It is reasonable to assume a survival time between these extremes. It

would appear that where slurry has been contaminated by the products of conception, discharged at abortion, there is some risk to cattle on pasture treated with that slurry for a period of at least three months, and possibly longer. Water is also a vehicle for infection and brucella organisms can survive for some period of time in water and likewise will persist on vegetation. Dust may transmit the infection (Essex-Cater, 1967). The disease in man is usually contracted by the consumption of infected raw milk or other dairy products. However, infection by direct contact with infected animals, carcasses, and excreta may occur--the organism entering the body through abrasions of the skin or the conjunctiva (Roberts & Shaw, 1966). The disease can be serious enough to kill and in its acute form has been known to cause blindness, paralysis, jaundice, and liver complaints.

Factory Farming

Factory farms and the contamination that they produce cause illnesses in humans that range from brain damage and depression to miscarriage and birth defects. They are also responsible for antibiotic-resistant bacterial infections and severe respiratory problems. Some effects on human health includes the followings:

1- Brain Damage and Depression

Scientists have shown that there is a link between exposure to the toxic chemicals found in animal waste and the development of neurological problems, including brain damage and depression. According to University of Southern California toxicology professor Dr. Kaye H. Kilburn, the "coincidence of people showing a pattern of impairment and being exposed to hydrogen sulfide arising from lagoons where hog manure is stored and then sprayed on fields or sprayed into the air" has a "practically undeniable" connection to neurological disorders in communities around the farms.

In an investigative report published in *The New York Times*, Ohio resident Robert Thornell discussed the permanent brain damage that he suffered when a factory farm was built near his home. "It's like I have a 2.1 gigahertz body with a 75 megahertz mind," he said. "I feel like collateral damage." When Thornell's wife was also diagnosed with brain damage, the couple was forced to move away from their home in order to prevent further deterioration of their health.

Fumes from manure pits have also been linked to severe depression. In a speech at the American Veterinary Medical Association, Dr. Kelley Donham, director

of the University of Iowa's Center for Agricultural Safety and Health, cited numerous studies that found unusually high rates of depression and anxiety among people who live near factory farms. A North Carolina study also found high rates of depression and fatigue in the neighbors of a pig farm.

2- Miscarriage and Birth Defects

Living near a factory farm can be catastrophic for pregnant women. For example, the CDC believes that manure from a factory farm seeped into the groundwater of a small Indiana town and caused at least seven miscarriages.

A joint report by the U.S. Geological Survey and the Oklahoma Department of Agriculture states that ingesting water with nitrate levels above 10 milligrams per liter can cause "blue baby" syndrome (methemoglobinemia), which is a condition that prevents blood from carrying oxygen and which can lead to "increased rates of stomach cancer, birth defects, miscarriage, leukemia, non-Hodgkin's lymphoma, reduced body growth and slower reflexes, and increased thyroid size." According to the report, nitrate levels in a "manure lagoon" on a typical pig factory farm measure an incredible 300 milligrams per liter, which is a level that creates a substantial threat to families who drink from nearby water sources.

Respiratory Problems

Animal waste emits ammonia, hydrogen sulfite, methane, volatile organic compounds, and particulate matter from fecal dust. These irritants enter the lungs of anyone who is nearby and can cause serious respiratory illnesses.

A February 2002 study conducted by Iowa State University and the University of Iowa Study Group found that as many as 70 percent of U.S. factory farm workers suffer from acute bronchitis, and 25 percent battle chronic bronchitis. Even more disturbing, a recent University of Iowa study found that an astonishing 46 percent of children who live on pig factory farms with more than 500 pigs suffer from asthma. On factory farms where antibiotics are used as a growth stimulant, the asthma rate in children climbs to more than 55 percent.

Bacterial Infections

Factory farm employees and people in the surrounding communities are frequently exposed to animal excrement and the dangerous bacteria it can carry—bacteria like *E. coli*, salmonella, and campylobacter.

On the Delmarva Peninsula in Maryland, Dr. Ellen Silbergeld found that more than 40 percent of "chicken catchers" and more than 50 percent of processing

plant workers were infected with campylobacter, a type of bacteria that causes diarrhea and abdominal pain and that can sometimes prove fatal. When a group of community members was tested for the bacterium, *every person* who was tested had a "positive" result.

Residents of a region known as "Feedlot Alley" in Alberta, Canada, have the highest rates of *E. coli* infections in the province, and *E. coli* killed almost a dozen children there in one three-year period. Dangerous germs from the excrement of farmed animals have sickened entire communities. A 1993 outbreak of cryptosporidium in Milwaukee sickened 403,000 people and killed 104 others. Scientists blamed the tragedy on animal excrement from nearby factory farms.

Antibiotic-Resistant Bacteria

Factory farms are also breeding grounds for antibiotic-resistant bacteria, which are known as "supergerms." On farms across America, the antibiotics that we depend on to treat human illnesses are now used to promote growth in animals and to keep them alive in horrific living conditions that would otherwise kill them. Countless new strains of antibiotic-resistant bacteria have developed as a result of this abusive practice.

Roughly 70 percent of the antibiotics used in the United States each year are given to animals who are used for food. What does this mean for you? It means that when you get sick, the antibiotics your doctor prescribes may no longer work.

Vancomycin, a drug that is known as a "last defense" in fighting the deadly blood infections and pneumonia caused by staphylococcus bacteria, is becoming obsolete because resistant strains have developed in farmed animals who are given the medicine as a growth stimulant. Similarly, the antibiotic used to treat campylobacter infections in humans is becoming worthless—even as these infection rates rise.

Swine Flu

U.S. health officials declared a public health emergency on Sunday, April 26, 2009, in response to the swine-flu outbreak. Cases have been confirmed in the U.S., Mexico, and Canada, and countries from Spain to New Zealand are investigating cases of the flu strain. There is speculation that the swine influenza originated on pig factory farms.

Sources of pollution in farms:

- Pesticides
- Animal carcasses
- Organic manure
- Slurry
- Parlour/dairy/vegetable washings
- Fertilizers
- Waste milk
- Sewage sludge
- Silage effluent

http://www.ecifm.rdg.ac.uk/farm_waste.htm