

HANDLING AND DISPOSAL OF HATCHERY AND FARM WASTE

Dr. Muhammad Yousaf and Dr. Shahid ur Rehman
Institute of Animal and Dairy Sciences,
University of Agriculture, Faisalabad Pakistan

Hatchery Waste Disposal

Hatchery industry is working for the supply of day old chicks to the Poultry Industry. Quality chicks are produced by hatcheries for the production of meat and eggs to fulfil the protein needs of the people. In hatchery working operation there is production of hatchery waste which is to be properly disposed as per recommendations of the regulatory authorities of the country.

There are many hatchery wastes which includes: -

1. Egg shell
2. Dead in shell
3. Fluff
4. Infertile eggs
5. Low quality chicks
6. Males chicks
7. C grade female chicks
8. Dead embryos

Out of 700 million hatching eggs, 140 million infertile and this will go to bakeries and shampoos as per previous practice because about 20% infertile eggs are produced. The usual price of these kind of eggs is Rs. 600/egg box in Summer and Rs. 1000-1200 in Winter season. However, due to Poultry Act these type of eggs is mostly disposed in big hatcheries. Ethically these type of eggs should not be use in human food.

Egg shells are source of calcium, dead in shell and very low quality eggs are source of protein and fat. 220 litter capacity drum are used for holding the waste and are properly compressed. Disposal of hatchery waste is by digging the ground, material is dumped and properly covered. Sometime the hatchery waste is thrown on open

places near water channel so polluting the water. Some poultry entrepreneurs minimize the size hatchery waste volume by grinding which requires much less space. Fluff is removed during cleaning and washing and dead in shell go with eggs shell. Male chicks are sold in Pakistan by contractor as a colorful chicks and earn a lot of profit c grade females are also sold. In some countries male chicks crushed, processed and use in animal feed which is against Animal welfare.



Hatchery Waste (Dead Chicks)



Hatchery Waste (Eggshells)

Handling and Disposal of Farm Waste

1. Poultry manure
2. Dead birds
3. Feathers
4. Clumps of manure
5. Vaccination vials
6. Chick boxes

Waste water should be properly disposed and drained. Racking of litter is done in breeder farm to maintain its consistency. Broiler litter is of high protein use for oil extraction and electricity production, if litter is dry then good because wet litter creates problems. There should be proper dispose of dead birds because dogs are sitting outside the farm, they eat and spread the disease this practice is not desired. Incineration of dead bird should be done. There should be proper disposal pit and with the passage decaying occur and only bones are left and later bones are also decomposed. Feathers on layer farm are removed and disposed, some people collect them and sales that are used in shutter making. Vaccination vials should be disposed after use. Chicks boxes for some days use for feeding than burn them. Dust is also a waste material. On an average 15% eggs will be either infertile or dead in shell when average hatchability is 85%. Hatchery waste constitutes of these eggs together with eggshells remaining after the hatch. Due to spreading of pathogenic organisms, some countries prohibits hatchery waste incorporation into byproduct meal. Hatcheries have to dispose this waste because there are very few profitable outlets for waste material from the hatchery. Vaccination vials, chick boxes, waste water should be properly disposed. Racking of litter is done in breeder farm to maintain its consistency. broiler litter is of high protein use for oil extraction and electricity production, if litter is dry then good because wet litter creates problems. There should be proper dispose of dead birds because dogs are sitting outside the farm, they eat and spread the disease this practice is not desired. incineration of dead bird should be done. Vaccine vials, chick boxes waste water should be properly disposed and drained. Racking of litter is done in breeder farm to maintain its consistency. Broiler litter is of high protein use for oil extraction and electricity production, if litter is dry then good because wet litter creates problems.

Eggs unhatched be macerated to destroy unhatched embryos in the hatcher. Carbon dioxide gas be used to destroy pipped eggs and cull chicks. A bin or trailer can be used to augur macerated debris, or into a sealed storage hopper by vacuum. The disposal be in accordance with local environment and practice keeping in view the workers/visitors, mice and rats, insects, wild birds, equipment like trays, boxes and buggies. Hatchery waste is produced in large amounts in the poultry industry which includes wastewater and solid waste. Waste water is resulting from water used to wash hatchers, incubators, wash are and where chicks are handled. Solid hatchery waste comprises infertile eggs, empty shells, late hatchings, dead embryos, a viscous liquid from eggs/decaying tissue and dead chickens. Solid hatchery waste is traditionally disposed by composting, land fill, incineration and rendering. Disposal of hatchery waste is mostly done by composting or by land fill, which costs chicken meat industry each year millions of dollars. In some hatcheries, hatchery waste is being rendered. Hatchery waste water methods comprises of its use for irrigation purpose, land fill, using it for irrigation, wastewater lagoon or disposing it into sewer. Some hatcheries use a wastewater treatment system. Hatchery waste comprises of crude protein (33.1%), ether extract (29.0%), crude fiber (12.1%), ash (21.5%) and gross energy (28.8 MJ/kg). Hatchery waste by-product meal apparent metabolizable energy is 23.9 MJ/kg and hatchery waste by product meal apparent amino acid availability is 3.5%. By centrifugation, waste of hatchery can be separated into liquid waste and solid waste. Use of inclined screens and a belt or filter press can alternatively separate waste components. Liquid waste can be separated from solid waste by using flexible multi-layer filters. A conveyor with an upper and lower conveyor roller can also be used to separate solid and liquid waste. Solid and liquid wastes are separated, placed in collectors located near lower and upper rollers. Eggshells can be separated from hatchery

waste as follows; powerful suction vacuum is used to remove dry, light weight eggshells from waste of hatchery leaving infertile eggs.



Rendering Plant in Hatchery

Eggshell waste can be separated by using a cyclone forced air separator and a shaking or vibrating device. In hatchery live chicks, unhatched chicks and clear eggs are placed with fixed gaps on a moving belt that allow only chicks to slide through, while unhatched eggs and shells are retained on the belt while embryos which are dead disposed into a separate container. Eggshells can be used to develop products which includes;

increase compost mineral content, around plants to deter snails and slugs, used as fertilizer when mixed with garden soil, aviary birds feeding by mixing in seeds, to increase its strength added to cement, in make mosaics by artists, in artwork to make textured paint for 3D effects and collagen production from eggshell membranes. For treating the solid waste following methods can be used; waste heated by a furnace for steam production running a turbine a turbine generator and thus electricity is produced. Hatchery waste is autoclaved, rendered, boiled, extruded, enzyme treated, ensiled to produce livestock or pet feed or fertilize is produced by composting. Product is on site stabilized by using an in-line composter. For treating hatchery waste most effective method is to establish an anaerobic digester system on site. To treat organic wastes, it is most popular process used in all other organic waste industries.

VALUE ADDITION OF JASMINE

Dr. Adnan Younis, Dr. Muhammad Aslam Khan, Dr. Atif Riaz
Institute of Horticultural Sciences,
University of Agriculture, Faisalabad.

Value addition in floriculture is an expanding industry worldwide and it has a great export potential. Pakistan is an agricultural country with small fragment land holds where floriculture crops can be the best alternative for improving the farmer's income. The concept of value addition could be a significant source in this regard where a grower can earn greater by exploring the available natural resources. A value-added product is a procedure to increase the profitable value and buyer appeal of flowers. Profit margin can be increased many folds when an ordinary raw material is reformed into a unique valued product. But, it involves additional time, trained labor and skills compared to traditional farming practices. For successful value addition process, it is suggested that flower grower should wisely identify the potential crop/plant that utilize

local resources, fulfill gap and must have high demand in the market and that can increase the net cash return.

Value addition process guarantees high returns to the farmer and provides quality valued products for the local and international trade, and it guarantees the most important facets of marketing and provide the people a stimulus to buy such value-added products. The value addition process overcome the problems like: unstable/low prices of raw material; government priorities; change in consumer's partialities; make more profit by omitting the role of middleman; high profit returns; pride in quality products which as a result increase the quality of life and living standard of the grower. Presently, share of flower-based products in Pakistan is insignificant; however, it has the potential of its expansion and

has bright prospects that is significant gear of diversified non-conventional horticulture industry.

It is the need of time to focus our intentions on non-traditional crop diversification for better broad-based horticulture development in Pakistan. It can meet the changing consumption habits and reduce imports and take advantage of Pakistan's global modest asset in different horticultural products. The floriculture processing business has significant potential to develop as the main driver of diversification of horticulture and agriculture. The floral value addition through modern processing technology, innovative packaging, post-harvest handling and supply chain management is crucial to develop this industry on sustainable basis to expand grower's income and their confidence on this industry. The valued floral products from flowering plants viz; essential oil of jasmine, rose, murraya, tuberose, plumeria, marigold etc. and plant's extract used in cosmetic and pharmaceutical industry are significant. These value-added products are expected to have less marketing competition in the local and international niches in the post WTO scenario and thus have the excellent potential for export and import substitution. At present, the government must redefine agricultural policies and also, motivation of private entrepreneurs is much needed, to make this value-added enterprise a significant player in the world trade of floriculture products. To attain this aim, determined joint efforts on the part of policy makers and planners as well as growers is mandatory. Institute of Horticultural Sciences, University of Agriculture, Faisalabad, is aiming on development of floral value-addition as an enterprise in the country. This institute is focusing on the transfer of technology to stake holders through on farm trainings and demonstrations. The research would allow the technical essentials for improved technological assistance and better plant management skills to produce quality flowers and their value-added products.

Jasmine, the national flower of Pakistan has a universal appeal and a long history of use as a cosmetic, perfumery, soaps, flavorings, medicine and is known as the "King of Aromatics" as its flowers contained the good

quality essential oil. The flower oil of Jasmine is called "otto" or "attar of Jasmine". Jasmine essential oils are primarily used in the perfume industry and have a high commercial value due to its therapeutic properties. Jasmine oil helps to tone dry/irritated and sensitive skin and has a positive effect on the respiratory system by comforting irritating cough and serving with hoarseness. It also helps in reducing muscular pain and can be effectively used as an anti-depressant and antiseptic.

Nontraditional crops, like jasmine, are 10 to 25 times economically valuable than other more traditional crops. Growing jasmine on a small plot of land, even as little one-half acre, has the capacity to produce an additional 3-4 lak per year. This amount is 10X more than the current average annual income earned by a rural farmer in Pakistan. By utilizing a small plot of land, food security is ensured. The idea of turning harvested jasmine flowers into essential oil ultimately increases the economic density of the product. Essential oil is aromatic and stable. This means that it is possible to take a nontraditional crop, which normally only has a 48-hour shipping time to a store and transform it into a product that could last years before it spoils. Turning 5000 kg of jasmine flowers into 1 kg of oil will make transportation more convenient since there will be less weight to transport.

Furthermore, the addition of jasmine cultivation will not change the social structure or means of income for rural farmers. Farmers account for 70% of the population, yet only contribute 25% to the economic activity in Pakistan. Over 85% of these farmers cultivate 12.5 acres or less, and because of their inability to optimize profit per acre are unable to pull themselves out of poverty. Rural poverty in Pakistan has not only led to a social disconnect with the rest of the world, it has also caused mass migrations to the few urban centers of the country where resources cannot keep up and thus crime and violence is thriving.