

SMOKING AND ITS EVIL EFFECTS

Bahadur Ali Kang, Muzaffar Hussain Salik,
University of Agriculture, Faisalabad

It is said that when Sir Walter Ralieg, a brilliant courtier of Queen Elizabeth I, returned from America where he had been sent on a colonizing expedition, he brought with him from the new world to the old world two novel gifts i.e Tobacco and Potatoes. Both of them immediately caught the fancy of and in no time became immensely popular with the people all over the world. One of them i.e potatoes have ever since proved a boon to humanity at large, but the other i.e tobacco has been the bane of its life since then.

Tobacco the harmful effects of which have been conclusively proved, is the principal crop that man grows to furnish not a necessity but to provide for a habit. This habit is satisfied by using tobacco in a variety of ways-smoking (cigarettes, cigars, pipes and hookahs) sniffing (Snuff) and chewing (alone and in Pans). In the beginning the people in the west smoked pipes and cigars in the East hookahs. Women, especially of respectable families, did not smoke at all. Cigarettes were not very popular. Their smoking has, however, increased more than a hundred and fifty times since the year 1905, while that of cigars and pipes have gone down. Today in the United States, people smoke more than 500 billion cigarettes each year and about seven billion Cigars.

Pakistan, a developing country has not lagged behind others in the production and consumption of tobacco. Infact, we are the sixth largest tobacco growing country in the world. The production of tobacco has been increasing at a much faster pace than that of several other crops of nutritional value. In 1947 tobacco was grown over an area of 28 thousand acres but now it has increased to 135 thousand acres. The production has gone up from 16 thousand tons to 74 thousand tons. When Pakistan came into being, there were no cigarette factories in the country, today their number is 24. They are producing 34 billion cigarettes and still cannot fully meet the demand. At the time of independence only a few million cigarettes were imported and consumed. Now it has increased of ten billion in the consumption in the past three years alone. Even the villages, who usually prefer hookah, are switching over to Cigarettes.

Smoking, especially cigarette smoking has given birth to a number of diseases, many of them quite deadly and has aggravated and increased the incidence of many others. By far the most common are lung cancer, bronchitis and emphysema. The cancer of lips, tongue, mouth, larynx and bladder is on the increase among smokers. Smoking has increased the number of coronary cases and accelerated the morbidity rate with its consequent absenteeism, loss of working hours and excessive demands on medical services. Even the babies, yet to be born have not escaped the harmful effects of smoking. Smoking pregnant mothers gives birth to babies prematurely. Their off springs are twice prone to respiratory infections and attacks of bronchitis and pneumonia, than those of non-smokers.

By far the most deadly disease that has come in the wake of smoking is cancer which has practically embraced every nation in its grip in varying degrees. However, the United States is its worst victim. Hundreds of scientists are engaged there in well equipped laboratories to find a cure of cancer. But in spite of millions of dollars that have been spent on research, the cure eluded them. The only thing that has been proved is that there is a definite link between cancer and smoking.

In the west a relentless campaign against smoking has been going on for years. In Pakistan the authorities too, have though belatedly, realized its harmful effects. It has been made incumbent upon cigarettes. But the campaign is only slipshod and perfunctory. If those who count are serious about it, the very first step is the prohibition of T.V., Radio and Newspaper advertisements. Smoking ought to be banned in all public places. The children from the very early age be made aware of the dangerous effects of smoking. The area under tobacco cultivation be gradually decreased and brought under crops of nutritional value. Ways to convert cigarettes manufacturing plants to the production of other goods may be explored. This is possible only if smoking is disliked and discouraged everywhere.

Nicotine is naturally present in tobacco and added to some electronic cigarettes. Nicotine is the root cause of addiction to and physical dependence on tobacco products. You can become dependent

quickly, sometimes even before you become a daily smoker. Smoking 1 to 5 cigarettes a week can be enough for a person to become addicted. Nicotine dependence is comparable to heroin or cocaine addiction.

The brain actively develops during gestation and adolescence. As such, the nicotine to which a pregnant woman is exposed adversely affects the brain of a developing fetus. The development of an adolescent's brain is also adversely affected if exposed to nicotine. The negative consequences associated with nicotine are not necessarily evident at birth or in adolescence but rather in the long term.

Cigarette smoke contains over 7,000 chemical substances, 69 of which are known carcinogens. Inhaled smoke circulates in the human body and reaches nearly every organ, affecting both the health

and well-being of smokers. The smoke also affects the health of non-smokers exposed to it.

Other tobacco products, such as cigars and cigarillos, or the use of a water pipe are not safer alternatives to cigarettes because they also present major health risks.

Electronic cigarettes are a special case. Their long-term health effects, for both users and people who are regularly exposed to the vapours (aerosols), are still unclear. It would seem, however, that electronic cigarettes also present significant health risks. There are many varieties of electronic cigarettes, and their manufacture in Canada has not yet been regulated. Keeping in view of the damages and predicaments, we should start a campaign against smoking. Particularly at institutions, it should be strictly banned.

STRATEGIES FOR CONTROLLING RESPIRATORY DISEASES IN POULTRY

*Bahar E Mustafa, **Muhammad Khalid Bashir, *Muhammad Ashraf,
*M. Zohaib Arshad, *UAF Sub Campus Toba Tek Sing,
**Directorate of Graduate Studies, University of Agriculture, Faisalabad

The respiratory diseases that cause severe problems to the poultry birds include Avian Influenza (AI), IB, ILT, CRD and Newcastle disease (ND). These diseases must be controlled by the adopting appropriate disease eradication and control policies.

There are many other factors that played their role in controlling disease. The first and the foremost strategy may be to improve the genetic potential of the birds to fight against the respiratory pathogens. Afterwards, implementation of variety of biosecurity practices may also reduce the incidence of many respiratory diseases in chicken such as adopting the policy of all in and all out placement. This reduces the life cycle of different pathogens that affect the birds of different age group or carry out their life cycle in the birds of different age groups. During outbreak, there is need to restrict the movement of affected birds, feeders, drinkers and the affiliated personnel's in order to reduce the disease spread to the healthy nearby flocks. Dogs, cats and other rodents must be controlled to curtail the spread of the outbreak. Moreover, after every flock, there is some gap before next flock is reared. Adoption of various other biosecurity measures also tends to inhibit the virus spread. This technique also helps in the inactivation of different pathogen with the environmental practices. Implementation of

appropriate vaccination schedule at farm may also help in the prevention of various respiratory diseases which may cause heavy economic losses to local farmers.

Control of respiratory disease

ND and IB are one of the most frequently prevalent diseases in birds, while ILT appears to be sporadic in nature. Vaccination is one of the most effective ways to control the respiratory diseases in chickens. Various factors that can impact the vaccine efficacy include the vaccine strain, dose, application method, seasonal and weather variation and fluctuations and *Mycoplasma* status. Modified live vaccine is used to prevent against the disease. Examples of live vaccines in poultry include LaSota, ND Clone 30, I2 and V4, which belong to lentogenic strains. The live vaccines are usually administered as the spraying, beak dipping, intranasal and intra ocular. If the vaccine is needed to be administered by the drinking water, then water is needed to be withheld for about 2 hours. Extreme care should be taken as virus can become inactivated if the water temperature is higher or chlorinated water is being used. Dried skimmed milk powder can be added (@1: 400) to the drinking water as it has virus stabilizing effects. While using aerosol method, particle method play an important role. Using coarse spray cannot penetrate deep in

the respiratory system and therefore does not provide full protection. Live vaccine can lead to bird to bird transmission and thus generation of humoral immunity. In serum vaccination produces IgG whereas in mucosa vaccination appears to produce the IgA. When boosting is done, it results in generation on anamnestic immune response. Under ideal conditions, virus in the vaccine replicates in the target tissue, and thus produces the local protection of the respiratory system. In case of the breeder flocks, killed vaccines are carried out which result in the generation of higher and prolonged antibody titre as well as transfer of the antibodies to the newly hatched chicks. Various examples of the killed strains include the Mukteswar, Komorov and Raokin strains which belong to the mesogenic strains. These killed vaccines are frequently administered as intra muscular injection. It should be kept in mind that they can only be used in the countries where the ND is endemic in nature. This represents the passive immunity, which tends to last for shorter duration of period and therefore, there is need to administer the vaccines. In order to avoid the reaction between serum antibodies and antigens, vaccines in the breeder are done so that minimal amount of antibodies are transferred to the newly born chicks so that vaccination at day 1 does not result in waning of overall antibody titre in serum.

More than 1 antigen can be added in the vaccines to make them bivalent or polyvalent vaccine. Several different viruses such as Coronavirus, Avibirna virus, adeniovirus and reovirus may be added in ND vaccine to make it a polyvalent vaccine.

Vaccine programs are designed keeping in view various factors and they include maternal immunity, climate, geographical conditions, availability of labor, breed and concurrent disease challenges. Market age of the broiler birds vary from 35-42 days of age. In routine, most of the broiler birds are vaccinated at 1 day of age and this vaccine is a combination of ND and IB. Afterwards, a second dose of vaccine is carried out at day 10-15 of age (varies in different areas) and finally, 3rd vaccine may be done between 20-30 days of age in the area where the disease incidence is higher. ND and IB vaccines mostly appear in the lyophilized forms and they are more convenient to be used under field conditions.

IB is caused by avian Coronavirus, which are basically structurally same but antigenically different. A variety of live vaccines are being used

to prevent against the clinical disease. There are many strains of the avian coronaviruses, among which Massachusetts (Mass), Arkansas (Ark) and Connecticut (Conn) strains are routinely administered along with the ND vaccine. Sometimes, these strains are not capable of providing full protection against the other strains such as D-274, D-1466 and 4/91 are also used along with H 120 and Mass strain in most if the Asian countries. Inactivated oil emulsion vaccine may also be needed to be done in case of the breeder and layer flocks and is usually done at 10-18 weeks of age (before the onset of egg production) and they are usually administered usually 3-4 weeks after 3-4 immunization with the live vaccines. Inactivation of the virus is usually carried out by using some chemicals such as beta propiolactone, formaline or using some other chemical. Broilers are usually administered IB vaccine on Day 1, which is repeated on day 10-18 of age. Mineral oil are used as adjuvant to enhance the immune response against the injected antigen.

Vaccine programs should be routinely monitored for vaccination. In case of any disease problem despite vaccination, the vaccine is first needed to be evaluated and moreover, challenge study is needed to be evaluated, however, such studies are needed to be done isolation facility.

Serological assessment is also needed to be done at market age and this can also help in the evaluation of the vaccine quality. In case of ND vaccination, live lentogenic vaccination can produce the HI titre of the 2^4 to 2^6 but much higher titers (up to 10^{11}) can be achieved after killed vaccination. Under normal conditions, healthy flocks without any disease conditions tend to have lower ELISA titres. On the other hand, flocks having higher ELISA titers are infected with the virulent field virus.

ILT vaccines are available in two form; one is tissue culture and other one is the chicken origin. The latter one is more effective and is used to immunize the broiler flocks in the regions where the disease is endemic. Application method is critical for the success of vaccine and oral administration provides better immune response. It has been found that the administration of 10^5 embro infective dose is necessary in order to obtain the satisfactory immune response following oral vaccination. Administration of modified live vaccine. Broiler flock is usually vaccinated at 10-21 days of age in endemic areas.

Nowadays, new generation of vaccines is also being employed in the prevention of respiratory pathogens and these include gene deleted vaccines, vectored vaccines and immunomodulators are used for the vaccination against the respiratory pathogens.

Examples of these vaccines include the immunization by incorporating the HN gene into various other viruses such as Fowl ox virus and turkey herpes virus/ pigeon herpes virus.

AMELIORATIVE EFFECTS OF PROBIOTICS, PREBIOTICS AND SYNBIOTICS IN LIVER DISEASES

Haroon Rashid, Junaid Ali Khan

Institute of Physiology and Pharmacology, University of Agriculture, Faisalabad

The diseases of malnutrition are most often associated with nutritional imbalances or excessive consumption; there are more people in the world who are malnourished. According to the United Nations World Health Organization, the greatest challenge in developing nations today is not starvation, but insufficient nutrition – the lack of nutrients necessary for the growth and maintenance of vital functions. The causes of malnutrition are directly linked to inadequate macronutrient consumption resulting in diseases such as obesity and metabolic syndrome.

Compromised gut-liver axis is considered an important player in mediating the obesity, non-alcoholic fatty liver disease (NAFLD) and metabolic syndrome. High fat high sugar (HFHS) diet causes gut dysbiosis and leads to production of lipopolysaccharides (LPS) by Gram negative gut bacteria. HFHS-diet also causes hepatic fat accumulation, inflammation, oxidative stress, obesity and ultimately NAFLD. The NAFLD often converts into more severe forms like non-alcoholic steatohepatitis, necrosis, fibrosis, cirrhosis and ultimately hepatocellular carcinoma. The hepatocellular inflammation and kidney injuries are secondary to altered intestinal permeability of toxins generated by Gram negative bacteria. The microbiota under normal physiological conditions produces endotoxins that are absorbed through hepatic portal circulation and normally cleared by Kupffer cells. Oxidative stress and low-grade inflammation in gastrointestinal tract are common features of metabolic diseases mediated via gut dysbiosis. Therefore, in this study, the mechanisms of anti-oxidants production for scavenging free radicals through use of probiotics, prebiotics and synbiotics were investigated. Intestinal integrity plays key role in lowering the endotoxin production and impaired lipid metabolism, which are considered as major players for pathogenesis of NAFLD and non-alcoholic steatohepatitis (NASH).

As the probiotics, prebiotics and synbiotics are associated with gut health, so the impact on gut-liver and kidney axis was also investigated in the present study.

The impact of specific intestinal bacteria such as *Lactobacillus acidophilus*, *Bifidobacterium bifidum*, *Eubacteria rectal* and *Blautia coccooides* ratio is well studied regarding host energy imbalance, obesity and chronic kidney diseases. Pharmacological strategies with healthy life style modification including bile acid pool modulators, reduction in weight, exercise, insulinotropic agents, balanced diet, and vitamin supplementation are adapted to alleviate the pathogenesis of NAFLD.

In present investigation, managerial aspects to minimize pathogenesis of NAFLD were explored using economical dietary interventions by exploiting probiotics and prebiotics potential in mitigating oxidative stress related hypercholesterolemia and hyperglycemia through improvement in gut microbiota. In our study, HFHS-diet administration for 18 weeks resulted in hypercholesterolemia and elevated triglyceride levels. Further, the higher values of ALT, AST, ALP and bilirubin in HFHS-Vehicle group suggested hepatic malfunction. Thereafter, probiotics, prebiotics and synbiotics supplementation for 4 weeks significantly ameliorated the increased serum lipid profile and liver function markers. The probiotics, prebiotics and synbiotics produced significant ameliorative effects on metabolic hormonal profile. The results from our studies suggested that administration of probiotics, prebiotics and synbiotics mitigates HFHS-diet induced oxidative stress and improved liver and kidney function markers presumably through anti-oxidant mechanism.