

Feature Articles Inside

# COVID-19 AND FOOD SAFETY

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## Seminar on Environment Friendly Agriculture & Food Processing: The Need of the Hour (02<sup>nd</sup> August, 1.30p.m. - 5.00 p.m.)



Following titles were presented at the seminar with the participation of many experts in the industry.

- ✓ Importance of consuming safe foods produced through environment friendly food processing
- ✓ Energy conservation in food sector: issues, consequences & remedies
- ✓ Eco-innovation in the agri-food sector in Sri Lanka
- ✓ Environmental pollution caused by agricultural and food processing industry and its mitigation and regulatory framework
- ✓ Contribution of organic certifications for environment friendly agriculture and food processing
- ✓ Organic agriculture and food processing for sustainable wellbeing

## Seminar on Industry Expectations for Food Science Graduates

(2<sup>nd</sup> August, 8.30 a.m. to 12.00 noon)

The objective of this seminar was to share the experiences and the expectations of the food industry employers, to develop the qualities of food science undergraduates in fitting the industry soon after graduation. Dr. Sujeewa Gunarathne, past president of IFSTSL, Mr. Delano Dias, CEO Cargills PLC and Ms. Nikeshala Marasinghe, a graduate from Sabaragamuwa University of Sri Lanka shared the views at the seminar.



## IFSTSL Events at the ProFood/ProPack Ag-Biz 2019 Exhibition

02<sup>nd</sup> - 04<sup>th</sup> August 2019  
 at BMICH  
 Colombo

## FoodTechno 2019: Innovations for Sustainable Future (03<sup>rd</sup> August, 8.30 a.m. to 4.30 p.m.)

Annual Research Session, FoodTechno was conducted for the 05<sup>th</sup> consecutive time as the scientific and educational segment of the country's largest food expo, ProFood Propack & Agbiz Processed Food Exhibition 2019. Fourteen selected research studies carried out at universities, research stations and food industries were presented under the theme of innovations for sustainable future. Keynote speaker was Prof. Rangika Halwathura- researcher, academic and inventor at the University of Moratuwa and a Professor in Civil Engineering Science in Sri Lanka. Effect of commonly used artificial fruit ripening methods on ripening behavior, quality and safety of banana by Ms. H.D.S.R. Premaseela was selected as the best research presentation.

## 3<sup>rd</sup> Inter University Food Science Quiz Competition 2019

(04<sup>th</sup> August,  
 1.45 p.m. to 4.30 p.m.)

The 3<sup>rd</sup> Inter University Quiz Competition was held with the participation of teams representing University of Peradeniya, University of Sri Jayewardenepura, Wayamba University of Sri Lanka, Ruhuna University of Sri Lanka and Sabaragamuwa University of Sri Lanka. University of Sri Jayewardenepura had won the trophy. IFSTSL wishes to pay special gratitude to Sri Lanka Food Processors Association for the support extended to complete these events successfully.



## Seminar on “Food Safety and Regulations : Kick - Start 2020”

A full day seminar on “Food Safety and Regulations : Kick -start 2020” was held on 29<sup>th</sup> of January 2020 at Renuka City Hotel Colombo 03. The objective of the IFSTSL in organizing this seminar was to support stakeholders of the food industry by providing necessary guidance for capacity development in food safety rules and regulations and to discuss on the global food regulatory demands by the national food industry and to move towards a food safety focused control system through appropriate changes in the food regulatory system and the regulatory bodies.

Emeritus Professor Upali Samarajeewa of the University of Peradeniya served as the resource person of the seminar.

A large number of participants from various food industries and government line agencies attended the seminar. IFSTSL wishes to thank the resource person, Prof. Samarajeewa and all the participants for the support extended to complete the seminar successfully.



## Seminar on Food Safety Awareness

The Institute of Food Science and Technology Sri Lanka organized and conducted a half-a-day seminar on food safety awareness for the advanced level International cookery and food and beverage students of Sri Lanka Institute of Tourism and Hospitality Management-Colombo 03 on 1<sup>st</sup> of November 2019.

The half-a-day seminar covered the topics of food borne illnesses, food adulteration, food regulations and their revisions, food color coding regulations and labelling requirements. The seminar was organized by Ms. Anjalee Omalka, joint secretary of IFSTSL. Logistic arrangements and student participation was supported by Mr. Dickson Kumara, a senior lecturer of SLITHM. Dr. Sujeewa Gunarathne & Ms. Anjalee Omalka engaged in this session as resource persons. Around 65 students participated the seminar and the students made use of this rare opportunity to clarify many aspects regarding color coding regulations and labelling requirements.





**Prof. K.K.D.S. Ranaweera**

Senior Professor of Food Science and Technology,  
University of Sri Jayewardenepura

## Foods for fighting with COVID19; challenges and opportunities

### “Food came before medicine”

The recent outbreak and rapid spreading of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are a global pandemic and primary concern worldwide, with a still uncertain outcome.

COVID 19 patients hospitalized with severe symptoms from the coronavirus are given medicines to bring down the fever and fluids to keep them hydrated, generally by intravenous tube. Some patients are connected to a ventilator, a mechanical device that helps them breathe. Drug companies have developed treatments for a handful of viruses in the last few decades, such as HIV and the flu, but the arsenal is minimal when compared with all the antibiotics we have for treating bacteria. We should remember that viruses are not bacteria, so antibiotics can hardly help.

In this context, the role of host nutritional status in determining resistance to infections needs to be recognized as one of the ways out. In the meantime, the traditional view of nutrition-infection interrelationships has to be replaced with a new paradigm that allows for direct effects of host nutriture (the state of the nutrition of the body) on pathogen virulence. A wide spectrum of studies has made an emphasis on the importance of developing natural immunity through foods. Hence, it is high time that the Sri Lankan Food Sector pays due attention to develop novel foods using commodities with antiviral properties. It is already known that vitamins, provitamins and certain bioactives have potentials to work against viral invasions and infections. The main difficulty is that viruses are technically not alive, instead depending on the “machinery” inside human cells to reproduce. Therefore, antiviral substances should target any part of that parasitic cycle that could otherwise harm the patient in the process.

Carotenoids are lipid-soluble pigments that vary in colour between yellow, orange, and red that impart to plants and animals. They are big group and among them, Lutein, an antioxidant, was found to inhibit the transcription (viral replication is the formation of viruses during the infection process) in of the virus. Foods rich in lutein are dark leafy vegetables, pumpkin, carrots, sweet potato, green peas, broccoli, lettuce etc.

Vitamin C is an essential micronutrient for humans. Sadly, vitamin C cannot be synthesized by us. Vitamin C contributes to immune defense by supporting various cellular functions of both the innate and adaptive immune system. Vitamin C supports epithelial barrier function against pathogens, promotes the oxidant scavenging activity of the skin etc. Vitamin C accumulates in phagocytic cells, such as neutrophils, and can enhance chemotaxis, phagocytosis, generation of reactive oxygen species and ultimately kill microbes including viruses. Phagocytosis is a critical part of the immune system. Several types of cells of the immune system perform phagocytosis, such as neutrophils, macrophages and B lymphocytes.

Using citrus fruits and juices (such as orange and grapefruit), red and green peppers, broccoli, strawberries etc can increase your vitamin C intake. Spinach gets top attention as a super food thanks to its high content of folate, vitamin A, vitamin C, fibre, magnesium, and iron. Watermelon containing vitamin C is an immune-boosting fruit. Studies show that 2-cup serving of watermelon has 270 mg of potassium, 30% of the daily value of vitamin A and 25% of the value of vitamin C.



Newer evidence suggests that Vitamin D also plays a major role regulating the immune system, perhaps including immune responses to viral infection. On the other hand, vitamin D deficiency may confer increased risk of influenza and respiratory tract infection and Vitamin D deficiency was found prevalent among patients with HIV infection. Though vitamin D's anti-viral mechanism has not been fully established, it may be linked to vitamin D's ability to up-regulate the anti-microbial peptides and human beta defensin. Therefore, consuming foods rich in vitamin D Herring, tuna, eggs, mushrooms, cow's milk and soy milk, orange etc can provide enough Vitamin D to us. In this part of the world, when our skin is exposed to sunlight, it makes vitamin D from cholesterol. The sun's ultraviolet B (UVB) rays hit cholesterol in the skin cells, providing the energy for vitamin D synthesis to occur. Generally, exposure of arms and legs for 5 to 30 min (depending on time of day and skin pigmentation) around 10 a.m. twice a week is often adequate.

In addition there are bioactives that are suitable antiviral agents. Studies show anti-influenza viral activities of quercetin against influenza A virus. Quercetin is a flavonoid, a class of polyphenols. Foods rich in quercetin are coriander, okra, onion, paper, sweet potato leaves, drumstick (moringa), cowpea etc. In addition, fresh, but not dried, ginger is found to be effective against human respiratory syncytial virus (HRSV) induced plaque formation on airway epithelium by blocking viral attachment and internalization.

It is known fact that beneficial gut flora is needed for proper digestion, detoxification and of course immune function. Hence, probiotics can certainly help to boost our immunity and curd and yoghurt that are naturally fermented can be suitable dairy products. A study carried out to assess the antiviral effects of saffron and its compounds has given promising results suggesting antiviral activities for saffron extract and its major ingredients. There are many more foods that potentially increase our immunity among them fruits and vegetables and spices are of importance.



## Personal Hygiene of Workforce in Food Manufacturing Organizations to Prevent Transmission of Microbiological Foodborne Illnesses

**Eresha Mendis (Ph.D.)**

*Member of the Food Advisory Committee/  
Senior Lecturer,  
Department of Food Science and Technology,  
Faculty of Agriculture,  
University of Peradeniya*

### Alarming Microbial Infectious Disease Situations around the World

In recent years, public health systems have been challenged by epidemics of emerging microbial infectious diseases of viral, bacterial, and fungal origin. Health threats emerging due to these infectious diseases used to be a major concern around the globe. Viral diseases are gaining the attention and account for several prominent infectious disease conditions in human. Currently the world is suffering due to coronavirus disease (COVID-19) pandemic and in general, healthy living has become a challenge to the humankind. Even though, viral diseases are the main topic of interest among people, a higher number of diseases are resulting from bacteria and account for a greater number of deaths in the world. Fungal species also cause infections in people, but most fungal infections occur in individuals who are having weakened immune systems. In a global view, it is noticeable that many of these infectious diseases are spreading in poor or developing countries, where hygienic and sanitary conditions are relatively less managed, though there are exceptions. In preventing and controlling these infectious diseases, it is extremely important to have a thorough awareness and act in preventing the occurrence of causative agents.

### Foodborne Illnesses of Microbial Origin are a Concern in the Food Sector

Foodborne infections are of great concern of the public, because food safety is a basic right of human. Food safety in simple terms is providing foods free from hazards that can harm consumers. However, availability of safe food is not always assured because of contamination of food with different types of hazards including microbial hazards that cause illnesses upon consumption. Supplying safe food is challenging, however, it becomes a mandatory requirements according to the food law of the country. In supplying safe food, different stakeholder groups play critical roles, and among them competent authorities, primary producers, distributors, food manufacturing industries, marketers and the consumers need to share the responsibility of ensuring food safety. Among other stakeholders, a greater responsibility lies with food manufacturing organizations and application of control measures provides means for them to control these diseases effectively. Among other hazards, control of microbial hazards are difficult because as name implies microbial hazards cannot be seen through the naked eye and science behind the occurrence of microbial diseases needs to be understood in handling them.

### Poor Personal Hygiene Links to Foodborne Illness Outbreaks

Foodborne illness outbreaks that potentially evolving from food manufacturing premises have been mostly linked to poor personal hygiene of workers engaged in food processing and

handling. Therefore, personal hygienic practices of employees are essential for the production of safe and wholesome food products. The performance standards related to food hygiene identified by a particular organization depending on their capacity allows, developing alternative or innovative means to ensure that employee practices do not result in insanitary conditions or contamination of products. However, these practices need to be decided by having understanding on the nature of contamination associated with personal hygiene in food manufacturing environments.

There are a number of ways that pathogenic microorganisms enter into food through human contact. Personnel are both reservoirs and vectors of microorganisms and can act as a source of microbial contamination to food products. The reservoir of microorganisms on and in the body can be divided into two broad categories; those found on the external surfaces such as on the skin & hair and in nose, mouth, ears & eyes and those found in the alimentary tract. Pathogens are shed in feces, urine, respiratory tract discharge, or by contact with infected skin can contaminate exposed products, food-contact surfaces, and product-packaging materials. Translocation occurs by people acting as a vector, picking up pathogens most likely by the hands, which are then transferred to food in a subsequent handling activity. Among others, intestinal or enteric organisms form one of the largest and most important groups that enter foods via human contact. Where workers are ill with foodborne illness, they excrete the infective organism in the feces for a period during the illness and for a time after symptoms cease. Feces from an infected worker may contain from  $10^6$  to  $10^{10}$  pathogens per gram. It is also possible for workers to carry infectious agents in their gastrointestinal tract without having any obvious symptoms; such persons are often termed carriers. *E. coli*, hepatitis A virus, *Salmonella* spp., *Shigella* spp., and *Clostridium perfringens* are enteric pathogens spread by workers. Also saliva, sweat, and blood may carry pathogens such as *Staphylococcus aureus*, *Streptococcus pyogenes* and hepatitis B virus.



***It's a Prime Responsibility of the Food Manufacturing Organizations to Ensure Personal Hygiene of its Workforce***

The establishment has the responsibility to ensure that no person affected with an illness in a communicable form, works in any area of the plant where there is a likelihood of disease transmission or food ingredients becoming contaminated, until the condition is corrected. A qualified individual (a manager or a supervisor) is assigned to oversee such responsibilities. Under normal conditions, restriction or exclusion of ill workers should be the first line of defense for foodborne illnesses. However, this can only be accomplished if employees are obviously ill or if they report their symptoms to management as required. Employees must report infected cuts, wounds, burns, respiratory infections, gastrointestinal symptoms, and jaundice. Once management knows that an employee has symptoms of gastroenteritis or another communicable condition, either restriction of the employee to nonfood contact duties or exclusion of the employee from the premises must follow. Severe illnesses such as typhoid fever, hepatitis A, shigellosis and *E. coli* O157:H7 infection, when diagnosed, should trigger mandatory exclusion of the worker. A physician must clear the employee to resume work in these cases.

***Handwashing and Other Protective Measures Need to be Promoted***

It is understood that frequent handwashing done properly, is the single most activity that can control the spread of, not only food-borne illnesses, but also colds and flu sicknesses of workforce. Handwashing is vital in minimizing the potential to transmit pathogenic microorganisms from the hands of food production workers to food, utensils, and packaging materials. Gloves have some advantages in preventing transfer of contaminants to food but needs to be used with proper understanding, if not gloves itself can contaminate food due to sweat accumulated inside the glove. To prevent contamination of food by hair, the routine wearing of hair



coverings by all personnel entering or working in a food preparation or processing area is recommended. Uniforms are excellent means of maintaining neatness and have a powerful psychological impact on workers' attitudes toward good sanitation. The clothing of food workers must be clean, neat, and without adornments such as jewelry or sequins. Further, with the exception of scheduled tasting panels, the consumption of food, including beverages and chewing gum, within the food process area should not be permitted. More importantly spitting is, of course, needs to be prohibited within all internal areas of the facility.

***Supervision and Examination of Workforce to Control Food Contamination through Human Contact***

A manufacturing entity should conduct a monitoring program, which consists of a pre-employment physical examination, followed by the employee's education and training in the basic attitudes and habits of sound personal hygiene. Ongoing training and meetings should follow these initial efforts. In addition, those who responsible for hygiene should ensure that regulations and standards concerning this subject are established, clearly communicated to workers, and adhered to by all. Facilities related to hygiene, such as rest rooms, lockers, and handwashing facilities should be developed and installed according to the good manufacturing practices. In performing these procedures effectively, both food handlers and supervisors should receive appropriate training in proper food handling techniques and food-protection principles and should be informed of the danger of poor personal hygiene and insanitary practices.

***Personal Hygiene is a Regulatory Requirement as well as an Important Component of Food Safety Management Systems***

According to Food Act No. 26 of 1980, the Sri Lankan food law, no person shall manufacture food that injurious to health and particularly food shouldn't be manufactured under insanitary conditions. Sanitary operation requirements including personal hygiene are well documented in regulations developed thereafter, Food (Hygiene) Regulations, 2011 and Food (Registration of Premises) Regulations 2019. Further, requirements for employee practices, personal hygiene, and employee facilities clearly defined in standards of food safety management systems. ISO 22002-1:2009 13.1 states that "personal hygiene facilities (must) be available to ensure that the degree of personal hygiene required by the organization can be maintained. The facilities (must) be close to the points where hygiene requirements apply and (must) be clearly designated." BRC Global Standard for Food Safety states that "staff facilities (must) be sufficient to accommodate the required number of personnel, and (must) be designed and operated to minimize the risk of product contamination. The facilities (must) be maintained in good and clean condition." However, adherence to good practices related to personal hygiene shouldn't be only targeting to meet requirements, but performed with clear understanding its importance to food safety.

***Ensuring Personal Hygiene Needs Attitudinal Change to Understand One's Responsibility and to Ensure Food Safety***

Poor personal health and hygiene habits are often difficult to change. Effective measures are thus necessary, because reflexive actions such as rubbing one's nose, adjusting the hair net, scratching or touching dirty clothing or any of a multitude of other actions related to poor personal hygiene are done without the individual being aware of his/her action. Training programs should target some sort of attitudinal change of workers, built through thorough understanding about the concepts of personal hygiene. Therefore, effectiveness of training programs needs to be continuously monitored and can be supplemented with posters, slogans, information sheets, contests, and other means of propagandizing the need for good health habits. In general, personal hygiene concepts and principles seems elementary, obvious and little more than simple common sense. However, it has great public health-related importance, thus dictates that they certainly shouldn't be ignored and emphasized repeatedly in food manufacturing plants to achieve effectiveness.

# Is it Possible to Transmit and Infect COVID-19 Virus through Food and Water?

Feature Article



**Niranjan Rajapakse (Ph.D.)**

*Senior Lecturer in Food Science & Technology,  
Faculty of Agriculture,  
University of Peradeniya*

## How Viruses Replicate, Transmit and Survive?

Viruses are the tiniest group of microorganisms of clinical concern known to survive on earth. Not like any other organism, viruses can't reproduce on their own and it happens only inside a compatible living host. During reproduction, viruses invade living cells of the host and acquire the control of nucleus to get their viral genetic materials replicated, and the cellular biochemical mechanism to get them assembled into new viruses, completely on the expense of the host cells. Therefore, new-born viruses can be released into the environment only from clinically ill or carrier hosts and sometimes from infected dead bodies. Thereafter, the viruses can be transmitted to another host via different sources such as, infected person, air, nonliving contact surfaces (fomites), vectors (mosquitoes and ticks) and food or water. The duration of survival of viruses in the environment until they reach another host is dependent on the characteristics of the viral type, nature of the source of transmission and the environmental conditions. This time interval can vary from few hours to several days due to the above factors. If the viruses don't reach a suitable host prior to the period of survival, most of them will naturally die-off or become noninfectious.

## Routes of Viral Infection

Viruses that infect humans are mainly of human or rarely of animal origin (zoonotic), but never of plant origin. In simple words, viruses that cause diseases to plants do not infect humans or animals. The five main routes of human-to-human viral disease transmission are aerosol (Eg. influenza & measles viruses), direct contact (Eg. ebola & HIV viruses), fomite (rotaviruses & influenza virus), oral (Eg. hepatitis A virus and gastroenteritis norovirus) and vector (Eg. dengue & chikungunya viruses). Once a virus gets into a host, it enters into cells of a specific tissue using a unique mechanism for reproduction, which is known as infection. For a successful infection of a virus, it should enter to the host through a correct path and reach the specific tissue. For an example, hepatitis A virus gets into the host through fecal-oral route, in other words ingestion with food or water contaminated with virus containing fecal matter. After ingestion, virus survives in gastric acid, moves to small intestine, penetrates intestinal wall and enters into blood stream to reach the liver for infection. Similarly most of the common flu viruses enter into the respiratory tract through nostrils or mouth.

## What is Coronavirus Disease (COVID-19)?

At present, all the continents of the world except Antarctic region are seriously affected by coronavirus disease (COVID-19) which is an infectious human disease caused by a newly discovered coronavirus. This new COVID-19 virus lands and enters into the inner lining cells of the lungs, binding it through a specific recognition protein (S-protein) present on the viral cell surface to a specific receptor (ACE-2) present on the lung cell surface. Most people infected with this virus will experience mild to moderate respiratory illness and few experience severe acute pneumonia condition leading to death. Thus the virus is named as severe acute respiratory syndrome coronavirus -2 (SARS-CoV-2) or COVID-19 virus.



## Transmission and Infection of COVID-19 Virus

The COVID-19 virus is primarily an airborne virus which spreads through air floating droplets of saliva or discharge from the nose when an infected person coughs, sneezes or exhales. This air floating virus directly enters into the lungs through nostrils while breathing. According to the research evidences, COVID-19 virus released to air can travel nearly one meter and remains floating several hours depending on the environmental conditions. Upon landing of the virus onto a fomite (cloth, wood, plastic, glass, metal, etc.), it has varying survival time periods depending on the nature of the fomite. Handling such fomites can contaminate one's hands with the virus and touching face with contaminated hands lead to indirect entry of virus into the nostrils or mouth. Since the target host cells of the virus are at the inner lining of the lung, virus should somehow get into the respiratory tract for infection. Clear clinical evidences confirm that, the virus also can enter into the respiratory system through the eyes passing them with tears into the nasal cavity. Except through the respiratory system, currently there are no evidences for the possible entry of COVID-19 virus to the lung via other means such as through blood or skin.

## COVID-19 Virus and Food Safety

Despite the severe public health issue of COVID-19 virus, it has created a considerable impact on food supply system, food security, nutrition and livelihood of mankind. A reasonable fear has been built up in the minds of the general public regarding the possibility of spreading COVID-19 virus through food and water. Though the knowledge on different mechanisms of infection of COVID-19 virus is still limited, this article explains the current state of knowledge on COVID-19 virus associated concerns on food safety.

Mouth cavity is the common doorway to both the respiratory and digestive systems and, passing down of food into the esophagus (tube that connects the throat and the stomach) and entry of air into the trachea (windpipe that connects larynx/ voice box and lung tubes) are controlled at the throat. Therefore, it is worth to know whether the virus can enter into the respiratory system, from the contaminated food while passing through throat. COVID-19 virus generally contaminate food through an infected person sneezing or coughing directly on them or handling them with contaminated hands.

1. A smear infection to another person is possible if the virus is transmitted shortly afterwards via food itself (specially unprotected raw consumed food with high load of virus) to the mucous membranes of the mouth or throat while ingestion. However, studies carried out previously with similar influenza viruses have confirmed the very low possibility of entering them into the respiratory system during ingestion. At the moment, there is no evidence to suggest that COVID-19 virus is any different in this respect.
2. The next important question is, what is the likelihood of entering COVID-19 virus through the digestive track after passing the throat, as most of the common viruses causing gastroenteritis? Currently there is no generally accepted research or clinical evidences to prove the entry of COVID-19 virus via different receptors present on other tissues, other than the known receptor (ACE-2) present on the lung cells as the entry points. The European Food Safety Authority has issued a statement reiterating the fact that there is currently no evidence that food is a likely source or route of transmission of the COVID-19 virus. In early April of this year, the World Health Organization (WHO) and Food & Agriculture Organization (FAO) of the United Nations have jointly released an interim guidance for food business on COVID-19 and food safety and have clearly stated that, there is no evidence to date of viruses that cause respiratory illnesses being transmitted via food or food packaging. Also, it is highly unlikely that people get infected with COVID-19 virus in a similar manner based on its mechanism of infection.

Based on the above information, it is clear that, there is no evidence of entering COVID-19 virus into its site of infection (lungs), through food while ingestion. One might question the possibility of food getting infected with COVID-19 virus and become a fomite. It is understood that viruses can infect and replicate only inside a living tissue. Thus, any food not having live cells or tissues does not theoretically allow propagating viruses but practically can act as a fomite due to cross-contamination. Though the recent researches have evaluated the survival time of the COVID-19 virus on different materials used for food packaging, no information is available how long can they be survived on unpackaged food (fresh fruits, vegetables, fish, meat, egg and food contaminated after processing or cooking). In this context, the role of food having living cells or tissues in propagating COVID-19 virus and becoming a fomite is an important aspect to be understood.

3. Since animal or human viruses don't infect plants, there is no risk of propagating COVID-19 virus in the tissues of the plant-based foods such as fresh fruits, vegetables, leafy herbs, yams, grains and nuts. But, such foods can harbor the virus on the surface (duration of survival is unknown) if they expose to direct contamination or cross-contamination.
4. Even though, the initial suspicion was that COVID-19 virus emerged from an animal source with some evidence, it has not yet been proven. However, dogs, cats, and minks have tested positive for COVID-19 virus in the field setting, following close contact with infected humans. According to the World Organization for Animal Health (OIE), studies are underway to better understand the susceptibility of different animal species to COVID-19 virus and to assess infection dynamics in susceptible animal species. To-date, preliminary findings from studies suggest that poultry and pigs are not susceptible to COVID-19 virus infection. Aquatic

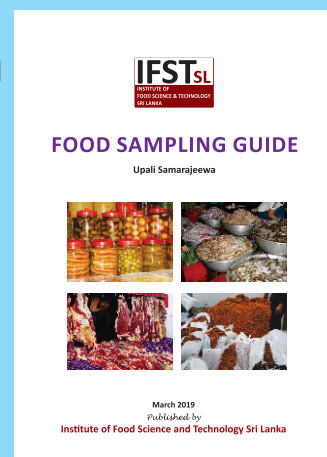
animals including fish also have no possibility of getting infected with the virus. In this context, it is highly unlikely to have COVID-19 virus infection in food animals and in their products such as, meat, fish, egg and milk. But, such foods may also harbor the virus on the surface (duration of survival is unknown) if they expose to direct contamination or cross-contamination.

5. Contamination of drinking water with fecal matter is one of the main food safety concerns in transmitting some viral diseases such as transmissible gastroenteritis and hepatitis A. The COVID-19 virus has been found in the feces of some patients. However, there has not been any confirmed report of the virus spreading from feces to a person. Moreover, COVID-19 virus has not been detected in drinking water and no evidence that air-borne viruses including COVID-19 virus remain infectious in water due to chlorination.

Based on the current knowledge on etiology of COVID-19, food is not a source of its viral propagation, but might be a fomite with very low or no possibility of indirect infection through oral route to human. However, new knowledge on disease dynamics of COVID-19 and viral survival on contaminated food is essential to understand the possibility of food more clearly, as a potential fomite. Till then, it is crucially important to practice the general rules of everyday food hygiene such as washing hands, food ingredients & utensils before food preparation, protecting food from sneezing & coughing, cooking food thoroughly & avoiding potential cross-contamination between cooked & uncooked foods, washing and disinfecting hands and common cutlery before food consumption, etc. Since food packaging materials have the possibility of contaminating and harboring COVID-19 virus along the food chain (especially at supermarket setting), it is always a good practice to quarantine the food items purchased from the market at least for two days before use. While following general food safety precautions, individuals should continue to protect themselves and others by practicing social distancing and good hand hygiene.

## FOOD SAMPLING GUIDE

A book titled 'FOOD SAMPLING GUIDE' authored by Emeritus Professor Upali Samarajeewa, and published by the IFSTSL is available for sale at a discounted price of LKR 500 at IFSTSL secretariat (No 21D, Wijaya Kumarathunga Mawatha, Polhengoda Gardens, Colombo 5). It explains the applications of different food sampling plans, sampling tools and sample handling, required in the food industry. Please contact Ms. Sandhya at IFSTSL Secretariat (077 1149397) during office hours to obtain copies. Libraries or groups purchasing ten or more books are entitled for special offer of 10% off on total bill.



# COVID-19 AND FOOD SAFETY

## (Frequently asked questions and answers)

### **Do we possess adequate knowledge to avoid exposure to corona virus?**

We have lived only 4 months with corona virus (COVID-19). It was a too short period for scientists to research on the subject adequately and understand the behavior of the virus and identify means to avoid it. Our current knowledge is based partly on experiences with similar viruses such as SARS and MERS or predictions combined with some analytical thinking by subject specialists. The information presented here may change with future research.

### **Are face masks actually protect us against corona virus?**

The main entry route of COVID-19 into our body are nose, mouth and eyes. Firstly, none of us would know whether the virus is in our body till about 7 days after infection. Therefore, it is the responsibility of each of us to ensure protection to our relations and friends against possible breathing out of the virus. Face masks form an effective barrier, but it should be discarded into a waste bin by bending it outward after 6-8 hours of use. Secondly, face mask protects us by preventing the blast of droplets that may be thrown out from the mouth and nose of a person during cough or sneezing.

### **Many people are using home made cloth face covering to protect themselves against this virus. Is this really effective as N95 or surgical mask?**

At the current level of knowledge on this subject, easily available face masks are the surgical masks. Cloth masks provide a barrier to large particles and droplets depending on the pore sizes of the cloth. Cloth absorbs liquid droplets carrying bacteria and viruses that are emitted during cough and sneeze. Depending on the nature of the cloth, mask can release other particles which may be inhaled, as normal cloths are not meant for protection against suction or forced flow of particles or droplets. In the absence of any other protective equipment, cloth mask is certainly helpful as a barrier. Surgical masks provide protection against large particles or droplets that may carry bacteria and viruses. It is therefore more effective against infections under normal life conditions.

N95 masks: N denotes that the mask is not resistant to oil and 95 denotes it filters 95% particles. It is recommended for health workers directly contacting infected persons.

### **Will washing off the fruits/vegetables with water, keeping under sunlight, wipe with a clean cloth kill the corona virus in fruits and vegetables?**

There are reports of COVID-19 hanging on to surfaces such as door locks, cardboards and wooden surfaces. This may apply to surface of vegetables and fruits. Washing with clean water helps to dislodge the virus from surface and wash away.

A recent research carried out in USA has indicated that sunlight can weaken COVID-19. Unfortunately, the report does not give much information on duration of exposure and the component in sunlight (UV light etc.) may be helpful. There appears to be some validity in this approach. UV light decrease viability of COVID-19 on surfaces and air. Exposure

to sunlight or UV does not prevent a person getting infected. Wiping off the surface after washing is not required.

### **What is the best way to clean/wash vegetables/fruits if it has corona virus on surface?**

Washing with potable water before consumption is the best to avoid the virus entering the body. Some food safety specialists believe washing with water alone (no soap) looks after the problem. Detergents may add harmful ingredients to surfaces of fresh fruits and vegetables. One should wash hand with sanitizers before handling fruits for eating.

### **Can COVID-19 spread through houseflies?**

There is no evidence or of likelihood of houseflies spreading COVID-19. However, if housefly rests on a surface containing virus and move on to another surface including a food, it may serve as a temporary intermediate vector as life span of virus on surfaces is limited. There is evidence of COVID-19 present on human fecal matter and urine. Housefly may carry particles from fecal matter on to a human body surface or human palms, which is very unlikely normally.

### **Can COVID-19 spread from surfaces?**

There is research evidence that virus can remain active on plastic and stainless-steel surfaces for up to 3 days, on copper surfaces for 4 hours and cardboard surfaces for 24 hours under laboratory controlled of temperature and humidity. Special care needs to be taken to sanitize food contact surfaces and avoid touching food contact surfaces.

### **Can COVID-19 spread on or transmitted through food?**

No. It multiplies only inside human and animal hosts. According to views of FAO and WHO, there is no evidence that virus could be transmitted to humans through foods or food packages.

### **Can COVID-19 be brought into food premises through raw materials?**

Yes, cardboard boxes and wrappers may retain virus on their surfaces for a few hours. Do not let in the packages from transport vehicle directly into processing area or kitchen. Keep them outside for few hours till virus get inactivated or discard the box or wrapper.

### **What are the measures proposed for food industry workers to be practiced aiming to prevent virus infections and spread?**

It is the same as for normal public of maintaining distance of 1 metre among workers. They should wear disposable face masks and disposable gloves throughout and dispose them frequently in between work breaks, shifts or taking over a different activity (no cleaning and reuse). Contamination of hands from the gloves and face masks should be avoided during removing them. Frequent hand washing with soap or sanitizer for 20 seconds each is essential. They should practice their normal hygienic and sanitation measures strictly. Workers should report immediately to supervisor any



uneasiness felt related to COVID-19 symptoms (fever, dry cough, running nose, breathing difficulties, fatigue) and report to state health authorities.

**What measures should be taken to keep food handlers one metre apart?**

Space out workstations one meter apart. Reset the work benches so that food handlers do not face each other across the bench at work. Reduce the number of food handlers in each area at a time. Spread food handlers to several shifts.

**What special measures should be maintained in operating canteen in food processing industries?**

Keep safe distancing (one meter), hand washing with sanitizers at entrance, staggering work staff break times to prevent crowding, and intense cleaning and disinfection procedures to all cutlery etc.

**Can livestock get infected by COVID-19?**

Up to now there is no evidence of livestock getting infected. Livestock industry is expected to observe more vigilantly the health and behaviour of the animals.

**Did COVID-19 come through meat to humans?**

There is evidence that the virus started in bats. It is believed that virus came through wild animals consumed by humans (without any checks on the animal health). There is no evidence of this virus transmission through livestock in any country. Health of livestock are checked regularly through the veterinary health systems.

**Are there special precautions applied in the meat industry?**

Persons engaged in slaughtering, processing, transport and selling are expected to follow the normal hygienic and sanitary measures strictly and trace all possible contacts if any person reports of illnesses and bring it to the notice of the food inspector and the public health inspector immediately

**Why are the developing countries dumping milk produced by them these days?**

The demand for milk is less now as restaurants are closed, and less people visit supermarkets.

**Can COVID-19 stand heat of cooking?**

Generally, viruses get inactivated above 74 °C. Research has shown that COVID-19 cannot live above 90 °C under any conditions. Cooking of food is associated with temperatures above 90 °C as the water or coconut milk boils in the cooking pot. Virus will not survive cooking of foods, including meat and milk.

**Are the mechanisms we observe currently disinfecting of possibly infected areas correct?**

In all food handling situations including selling, cleaning to get rid of dirt and sanitizing to get rid of microorganisms are two processes in that order. Food contact storage surfaces, including tables and trays holding foods for sale should first be washed with water and dirt removed before spraying sanitizers. If dust and dirt this is not removed first, sanitizers will be absorbed by dirt and non-food particles making them less effective against viruses.

**How have the food industries affected directly due to COVID-19?**

Several meat processing factories were closed totally in developed countries after detection of infected food handlers.

**Is it safe to combine bleach (chlorine releasing cleaners) with other detergents and sanitizers for cleaning food contact surfaces?**

Chlorine from bleachers may react with acids (vinegar) or ammonia releasing toxic fumes. Combining them is not recommended in the food industry.

**Members of the Board of Governors and the Executive Committee - 2020**

The 8<sup>th</sup> Annual General Meeting of the IFSTSL was held at Royal Colombo Golf Club, No 223, Model Farm Road, Colombo 08, on 12<sup>th</sup> September, 2019 at 6.00 p.m. At the meeting Prof. Niranjala Perera, was appointed as the President for the year 2020 and Dr. Prasanna Gunathilake was appointed as the president elect. Following is the composition of the Board of Governors and the executive committee elected for the year 2020.

**Emeritus Prof. Gamini Fonseka**

B.O.G - Chairman

**Emeritus Prof. Upali Samarajewa**

B.O.G - Member

**Mr. Rohantha De Fonseka**

B.O.G - Member

**Dr. D.B.T. Wijeratne**

B.O.G - Member

**Mr. Sarath Alahakoon**

B.O.G - Member (as President of SLFPA)

**Prof. Niranjala Perera**

President

**Dr. Prasanna Gunathilake**

President Elect

**Dr. Sujeewa Gunaratne**

Immediate Past President

**Ms. Anjalee Omalka**

Joint Secretary

**Ms. Chamodika Senarath**

Joint Secretary

**Mr. Cyril Wickramaratne**

Treasurer

**Mr. Thusith Wijesinghe**

Assistant Treasurer

**Dr. Sandun Abeyrathne**

Editor

**Prof. K.K.D.S. Ranaweera**

Committee member

**Dr. Eresha Mendis**

Committee member

**Dr. Niranjana Rajapakse**

Committee member

**Mr. Maliek De Alwis**

Committee member

**Mrs. Neranji Jayasinghe**

Committee member

**Mr. Dammika Gunasekara**

Committee member



# Environment Sustainable Livestock Production

Ms. A.L.Y.H. Aruppala & Ms. R.M.U.H. Senanayaka  
Environmental Officer, Central Environmental Authority

The world's livestock sector is undergoing a massive transformation, powered by high demand for meat and milk, which in developing countries is likely to double over the next two decades. Worldwide food demand is shifting from staple crops to processed food and high protein animal origin products, such as egg, meat and dairy. The major driving force behind this increasing demand for livestock products is a combination of population growth, protein malnutrition, urbanization and income growth and the increasing demand for variety to meet the changing consumer preferences.

As a result of globalization, the Sri Lankan livestock sector is experiencing enormous revolution through the efficient use of locally available feed resources, adequate management practices and breeding programmes for indigenous and upgraded animals, and diagnostic tools and prophylactic measures for the control and prevention of animal and zoonotic diseases to double the food production to cater the demand for local and national consumption and international trade.

However, this rising demand meets the increased outputs will have to come mainly from strengthened and more efficient use of the land, water, plant and animal genetic potential, fisheries and forestry resources ultimately disposing huge quantity of waste to the earth. Thus, the challenge facing today's Sri Lanka is how to improve the livestock production with environmental sustainability or without adversely affecting the environment. Sustainable development has been defined as "development that meets the environmental, social and economic needs of the present without compromising the ability of future generations to meet their own needs".

As animal numbers increase to meet the demand for meat, milk, and eggs, serious consequences could arise in terms of soil and water pollution, competition for biomass, land, and water, and increased green-house gas emissions. Expansion of livestock production while managing of natural resources in a sustainable manner is very essential. Since, the envisioned negative effects for the environment through massive livestock productions are not inevitable. Hence, the scenario analysis to explore the strategies while assessing the impacts benefits both livestock sector and environment.

As a management practices, the integration of crop and livestock production system offer many chances for farmers in mixed crop-livestock systems that produce foods through sustainable increase in productivity while resource use efficiency. Animal manure was found to be the dominant source of phosphates from agricultural activity around urban centers and livestock-specialized areas. On the other hand, livestock manures remain an important part of soil fertility management, contributing the nitrogen used for crop production in mixed crop livestock systems. Meanwhile, anthropogenic greenhouse gas emissions are attributable to livestock.

Sri Lankan livestock industries are regular via the Environmental Protection License (EPL) which is a regulatory/legal tool under the provisions of the National

Environmental Act No: 47 of 1980 amended by Acts No 56 of 1988 and No 53 of 2000. Industries and activities which required an EPL are listed in Gazette Notification No 1533/16 dated 25.01.2008. (EPL) scheme was introduced under section IV (A) of NEA part 23 (B) as industries are classified under 3 lists i.e., List "A", "B" and "C" depending on their pollution potential (solid waste, noise, waste water, air pollution) Part "A" includes of 80 significantly high polluting industrial activities and Part "B" comprises of 33 numbers of medium level polluting activities. Part "C" includes of 25 low polluting industrial activities which have been delegated to Local Government Authorities, namely Municipal Councils, Urban Councils and Pradeshiya Sabhas.

Several livestock related industries were mentioned as high pollution industries such as under A<sub>32</sub> category food processing industries (poultry, dairy, meat and fish) were prescribed according to work force 25 or more than 25 workers. Slaughter houses were categorized under A<sub>33</sub> category. Machineries used all type of egg hatchery farms, Number of animals 2500 or more than 2500 poultry farms, Number of animals more than 50 goat, cattle or piggery farms, Mixed farms number of animals 2500 or more than 2500 were categorized under A<sub>40</sub> category.

Some of livestock related industries were prescribed under B<sub>15</sub> and B<sub>18</sub> category. Food processing industries (poultry, dairy, meat and fish) work force more than 5 and less than 25 was prescribed under B15 category. Poultry farms number of animals in between 250 and 2500, Number of animals more than 5 and less than 50 piggery, cattle and goat farms, mixed farms number of animals more than 250 and less than 500 were categorized under B<sub>18</sub>.

Through the EPL, discharging of wastewater into the environment is controlled by the standards were published in the Gazette Notification No. 1534/18 dated 01/02/2008 termed as the National Environmental (Protection & Quality) Regulations No 01 of 2008. Tolerable limits of the waste water is stated under three final discharging points as on land for irrigation purpose, discharge to inland water bodies and coastal discharge with standard limits of the parameters were changed and all parameters should maintain below to tolerable limits such as level of Biochemical oxygen demand (BOD), Chemical oxygen demand (COD), Electrical conductivity (EC), Total suspended solids (TSS), Total dissolved solid (TDS), pH, Temperature of discharge, Dissolved phosphates Oils and greases, concentration of some metals (Hg, Pb, Zn etc), Pesticides, detergents etc. which can be minimized the serious issues aroused in terms of air, soil, water pollution, and increased green-house gas emissions. In these cases, the industrialists will be requested to consult reputed laboratories to obtain such test reports periodically, as may be indicated in the EPL.



# PUBLIC PERCEPTIONS ON MILK POWDER

## IS IMPORTED MILK POWDER UNSAFE ?

Article published on FB (13<sup>th</sup> March 2020)

**Emeritus Professor Upali Samarajeewa**



There is a growing controversy in Sri Lanka on the safety of a milk powder marketed by a certain manufacturer.

The intention of this article is to explain the scientific principles that should be adhered to, in assessing safety of a food.

The most recent controversy is related the certification issued by Sri Lanka Standards Institution to a brand of powdered milk. There are two essential activities that should be carried out in issuing quality and safety certificates by reputed bodies. The first is to test the food product based on a sampling plan to check whether the food (milk powder in this instance) meets the internationally accepted (Codex) and locally established standards related to quality and safety. As I see in the news, SLSI has fulfilled this requirement.

The second is to check the steps in the food value chain (starting from health of milking cows through milking to processing up to release of powdered milk to the market). These steps aim in identifying possible food safety hazards that may occur during farming, milking, and processing. After identifying the potential food safety hazards, critical processing points (locations) are checked to ensure that accepted and documented practices, such as heating temperatures, functioning of the treatment machines operates as stipulated to eliminate the hazard. This second activity is technically described as Hazard Analysis and Critical Control Points (HACCP). HACCP certification is practised for tea, desiccated coconuts, fishery products and spices as an export requirement from Sri Lanka. HACCP method is established for each food process by a group of food scientists. HACCP assessment consists of checking on evidence of adherence to processing procedures and any corrective actions taken historically if non-conformities were observed.

The HACCP assessment cannot be followed from Sri Lanka for an import product and a team of scientists from SLSI has visited the factories, assessed their process, the historical process records and made recommendations. According to the information available the check has been carried out successfully leaving no doubts. This assessment visit is not a shopping spree or a bribe to any of the visiting scientists from SLSI, and it is unethical to interpret the surveillance visit from a crooked angle. It is unscientific to question above practices on hearsay unless there is valid evidence against assessed technical information.

Another issue that has been brought to the notice of public by persons who are not experts on food safety is that various unpermitted additives are incorporated to milk powder. Addition of pork fats and palm oils are mentioned as examples. Food manufacturers are required under the internationally accepted agreement on Technical Barriers to Trade (TBT) of the World Trade Organization (WTO) to mention the constituents in the product label. If the label does not indicate such added substances in a market food, it is unethical for any person to mislead the consumers on non-existing issues. Differences between constituents present in the product and constituents indicated in the label could bring about serious trade issues, and as such no responsible manufacturer would attempt it. In milk products where various other oils are added, it is clearly declared in the label in line with international requirements.

One could also hear statements to the effect of various toxic materials are present in powdered milk. Milk imports to Sri Lanka are tested before approval by the Food Advisory Committee, if there are doubts. Historically, there were two instances of such doubts. First was the presence of melamine added to milk produced in China. Second was the presence of Dicyandiamide (DCD). DCD is a chemical applied to grasslands to reduce emission of greenhouse gases and leaching of nitrates to waterways from grasslands. DCD may appear as a residue in milk. DCD residues had been detected by the quality management system of the milk processing factory and its entry into market milk powder has been prevented for ever. On both these instances the Food Advisory Committee of the Ministry of Health got multiple milk powder samples tested at a reputed accredited laboratory in Singapore and milk products were cleared as free of the toxic substances. Both these toxic compounds were not reported in any of the imported milk powders in the local market. It is therefore unethical to use such unproved past situations, against any milk importer today.

If there are doubts on any other toxic constituents in powdered milk, it is up to the learned persons to prove it with laboratory evidence rather than trying to link with syndromes of unknown or unproven origin. Such efforts are only opinions and not valid scientific information.

Following are the responses to the article by FB readers and their names are abbreviated.

- DW:** Excellent write up Upali. Whole problem is some ... who have no expertise in any field make comments and statements on things that they do not have any idea. Even some doctors do this. They do not understand if you need to check something it needs to be checked at the source too.
- S-WW:** An eye opening writeup...even though Fresh milk is available can everybody in SL afford to use fresh milk ?: Very expensive and need a fridge to store the balance milk. Only solution is powder, whether domestic or imported. Quality should be regularly checked.
- CI:** Valuable post. Thanks a lot Upali.
- SG:** Is there a link to this write up or have you sent this to media?  
**Upali Samarajeewa:** It appeared in Island of 10<sup>th</sup> March under opinions. The content is common knowledge of a student qualified in Food Science  
**SG** Apparently not to our GMOA and other 'educated'
- TG:** Principally agree with your facts sir. However, there may be instances practically deviate from these expected situations. Melamine and DCD issue were known by us only when other countries voiced about it. Otherwise we would have been drinking the milk until now. DCD was actually found in milk powder available in Sri Lankan market and withdrawn. So we are not very much in comfort zone. Anyhow it is always better to improve our local production to possible extent.  
**AC:** TG it's not true that we found DCD contaminated milk in Sri Lanka. The test was conducted without following proper scientific process or equipment and not confirmed by any other laboratory...  
**SS:** TG, I agree with AC's facts...
- NJ:** Very good Upali. Excellent write up. Hope the said non-scientific personal read these without accusing people unnecessarily. They are not experts on the subject and so they must listen.
- Upali Samarajeewa:** I would be pleased to receive more responses so that I can bring out examples from my experience. Thanks ...
- NJ:** Adulteration can happen anywhere, willingly or unwillingly. What is required is to ensure that proper monitoring is done at all points of the food chain. Even politicians must believe the scientists when they say that proper tests and procedures are being done. Procedures may require travel to point of origin. We must be able to trust our own people that they do the right thing.

9. **ZA:** Upali Samarajeewa Generally any milk powder may be considered as a safe food if it does not have in or upon it any natural or added substance that does not render the milk powder injurious to health. On that ground the milk powder is safe. However my concern is that whether the milk powder in the market is manufactured or made from cow milk and how and by whom it is verified, confirmed and certified that the milk powder in the market has been manufactured or produced from cow milk.? There are grey areas in this regard. What are the legal requirement for the manufacture, import, sale or distribution of milk powder in Sri Lanka? Are all these requirement fulfilled or complied with when manufacturing, importing , selling or distributing.  
**Upali Samarajeewa:** ZA, Milk quality and safety is checked at the point of purchase by the industries. Some industries return to sellers cleaned cans for the next day supply to prevent rapid microbial spoilage. Payments are based on quality of liquid milk.  
**ZA:** Upali Samarajeewa <https://youtu.be/QacVRLG0Pec> (Agra milk adulteration on the rise)
10. **LT:** Thank you. Are they (powder milk & liquid milk) have same nutrition ?  
Why liquid milk popular in European countries?  
**Upali Samarajeewa:** Milk is popular all over the world due to its high nutritious value. When milk powder is reconstituted to liquid form for drinking, it carries the same nutritious value with respect to proteins, fats, carbohydrate and minerals.
11. **IS:** Excellent write up Upali. We read your article in yesterday's Island.
12. **SNJ:** This is a timely writing and very important to enlighten the general public on the issue as they might be scared in actions. As a responsible entity and being the National body, SLSI has taken right steps with the lead of DG to verify it's compliance. As you, Upali Samarajeewa, correctly highlights, HACCP System can verify it is potential hazards and assesses its potential risks for consumption. As we all are quite familiar with many advanced food safety systems in the industry, if the organization is certified means that they have taken required precautions to make conscious decisions. Specially FSSC 22000 has been recognized as most demanding and promoting standard where consumers can have an assurance on. Hence more discussions are required among food professionals who have mastered the subject for many years...
13. **BS:** You are 100% right Sir...I have close to 5 years of experience in NZ dairy product manufacturing and specifically the food safety management system of NZ which is completely managed by the government. NZ Ministry for Primary Industries is responsible for setting up standards. These standards are well detailed. Covers heaps of testing requirements. All compliance activities are getting audited once in every three months. HACCP is a regulatory requirement. Any CCP failures a+ critical food safety failures must be reported to MPI/AQ within 24 hours. If we want to release the affected product we must conduct extra testing and inspection and must be able to convince and satisfy MPI that the product is safe for human consumption. Otherwise product has to be disposed and all disposal evidences must be submitted to MPI. I have FSQ experience in SL and Canada as well. But I haven't seen such a strict regulatory system even in Canada. Just let me know if you come down to NZ. I can arrange a visit to my factory.  
**KKRP:** BS, can you explain why New Zealand is importing palm oil in large amount to New Zealand. I am requesting this because people questioning about safety of New Zealand milk powder are saying that imported palm oil use to produce milk powder in New Zealand.  
**BS:** KKR, This is completely bogus. NZ imports Palm oil as a cooking oil and as an ingredient for manufacturing of non-dairy fat spreads. This is same in Sri Lanka as well. However New Zealand is one of the largest importers of Palm Kernel as an animal feed. NZ government has already regulated the use of Palm kernel per animal even as a feed.  
**KKRP:** BS, Thanks for your reply. Please explain what is NZMP fat fill milk powder and reason to produce this product.  
**BS:** KKR, NZMP Fat Filled Milk Powder is made for low income market like Africa. This product is not made for SL.  
**KKRP:** BS Thanks for your valuable information  
**BS:** GRG, You are right. There are lot of independent certification bodies exist in NZ. However, NZ government regulations around FSMS is more stringent than ISO/BRC or any other GFSI recognized standards.  
**GRG:** BS, I know how strictly these standards have been monitored and compliance is the utmost priority from top to bottom. Every product and process is audited by internal and external auditors and verified at least once a year. Traceability is one important aspect of these audits. So if Sri Lankan authorities need independent audits to verify the compliance they can hire accredited auditors like SGS in NZ rather than speculating things  
**GRG:** BS, yes true. I also work with MPI. I don't understand what evidences these professionals who make comments against NZ milk powders, have to prove their claims??.
14. **HG:** Dear Upali, I read your article in the newspaper also. This is very revealing for all those who take imported milk powder and other processed foods. This should enlighten the Sri Lankan people. Facts are stubborn.
15. **SN:** One could understand if medical professionals give their opinions/advice on the merit or demerits of consuming milk per se to patients with certain health conditions rather than making indifferent statements.  
**Upali Samarajeewa:** Unfortunately they are yelling without facts. See the leaflet ...  
**SN:** yes Professor ...
16. **SJ:** Thanks Upali for the write up. In fact, yesterday there was a FB post by an SLSI officer and there I commented that they invite GMOA to SLSI and teach then the process of certification ...
17. **KP:** Very good article. I read it with interest.
18. **SH:** This will not stop discussions and comments based on unfounded assumptions and prejudices. Wait for a few months and see.  
**Upali Samarajeewa:** Let us keep on educating the public.
19. **CP:** Excellent and a timely write up Upali.
20. **DW:** What is GMOA's position on this ...
21. **FA:** We need more articles like this from experts.
22. **CS:** Well said sir.. I have tried my best to convince the same story to our friends in SL ... They only believe what media is posting and relying on fake news without any scientific evidence.
23. **GF:** There are requirements that need to be satisfied by milk powder producers. These requirements and stipulated standards are international as well as national. There many authorities to check these requirements. It's a primary duty of these organizations to check the products to verify whether the producers, importers and distributors adhered to maintain these requirements. If the independent state sector organizations can justify that they have monitored and results and found the milk powder manufactured locally or imported maintained the required standards, public should not worry much about the comments of individuals or even Associations. However major responsibility lies with organizations like SLSI, ITI and other state sector testing authorities to reveal their findings to clarify this issue to the public.
24. **PP:** Earlier they were saying milk fat is adulterated with lard. Now palm oil. Next will be tallow ..or with something else
25. **PM:** Dear Emeritus Professor,  
Yes we all know the goodness of liquid milk. But we have certain doubts about powdered milk available in the Sri Lankan market. Because we have heard about the Melamine Scandal and DCD scandals, Botulism scare, Dioxin contamination, E coli contamination, standardization of milk powder by adding Lactose and Palm oil and finally Recombinant bovine growth hormone (rBGH) issues connected with powdered milk. Do you think we have facilities in Sri Lanka to check all the imported milk powder to rule out above contamination? Are you in a position providing a single test report covering all the above aspects?  
I wish to quote from your article "Both these toxic compounds (DCD & Melamine) were not reported in any of the imported milk powders in the local market. It is therefore unethical to use such unproved past situations, against any milk importer today" and wish to say that the above statements are wrong. Please be informed that the CFA issued Directives to withdraw certain batches from the Sri Lankan market.  
My humble request is please do not try to promote powdered milk which are presented as "Trusted for generations", "Every drop is guaranteed", "DHA for brain development" and so forth. THANK YOU  
**Upali Samarajeewa:** Dear Mr. **PM** The way we see unacceptable components in foods we may not have anything to eat or drink. You know better than I about formalin and hydrogen peroxide. I do not want to open cans of worms. One important think we need to realize is, in countries where there is Food safety management systems operating, public come to know happenings, authorities check them and take actions. Here in Sri Lanka with end product testing only the FIs know what has happened, unacceptable products continue to be in the market and exposure of humans continue. My effort is not focusing on particular manufacturer. I am talking about the general misinformation given by learned professional bodies. This is because some people carry chips in their heads for ever to attack certain identified sharks and sprats. See the unprofessional language they use both in public platforms and at top official bodies too as I heard a couple of days back. Let us ask our professionals to be ethical when they speak out. We cannot use our doubts to accuse anybody. If we have credible evidence of what is happening today in Sri Lanka and not 10 years back somewhere, let us jointly highlight them. Let us talk in general terms on the issues and not target individual situations of the past. We cannot live and work based on doubts.