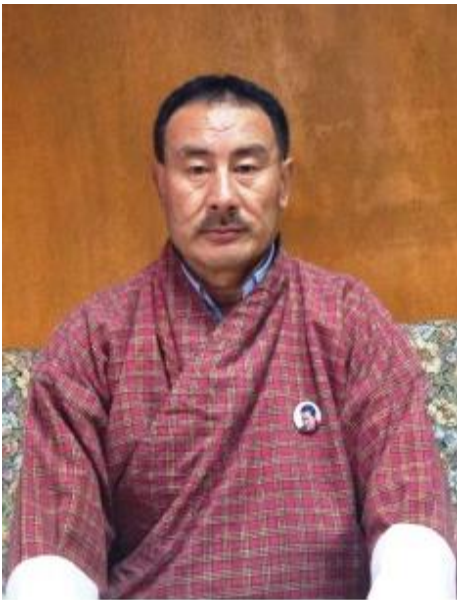




## *Foreword*

Dear Readers,



**Namgay Wangchuk**  
Director General

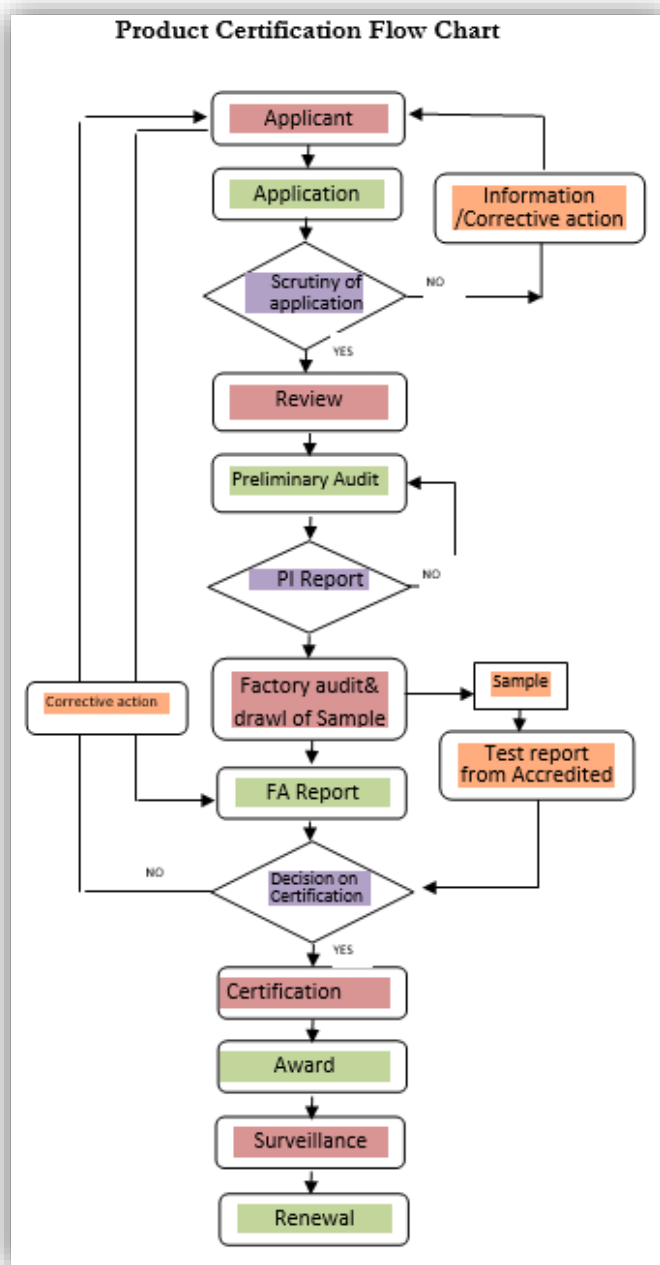
“Joen-pa-Lek-so” to the II<sup>nd</sup> Issue of BAFRA e-Newsletter! We hope that our Newsletter will become an essential part of your professional life; a resource that will keep you well-informed and updated on the Bhutan Biosecurity, Biosafety and Food Safety. This Edition of the Newsletter covers 14 articles which highlight BAFRA’s Achievements relating to Biosecurity, Biosafety & Food Safety.

The Newsletter consists of original works of BAFRA colleagues both at the Head Quarter and in the field. I would sincerely congratulate our BAFRA field Offices in 20-Dzongkhags, for the notable achievement being made through their relentless efforts, hard work and sacrifices in upholding the sacred Mandates bestowed upon BAFRA by the Royal Government.

In wrapping up I would like to encourage all our readers to take interest in BAFRA’s works and keep in touch. We are always ready and open for future collaborations and active participation from all of you in safeguarding our Bhutan’s Biosecurity, Biosafety and Food Safety. You can contact us anytime by emailing at [bafraheadoffice@gmail.com](mailto:bafraheadoffice@gmail.com) or call us on Toll Free No: 155. We welcome your valuable inputs and suggestions for the improvement of this e-Newsletter.

*TRASHI Delek!*

## BAFRA ACCREDITED FOR ISO/IEC 17065



Bhutan Agriculture and Food Regulatory Authority (BAFRA) has been accredited for ISO/IEC 17065-2012 Conformity Assessment (Requirements for Bodies Certifying Products, Processes and Services) by National Accreditation Board for Certification Bodies (NABCB) as an accredited certification body from March 2018. To assist the food establishments in the country, BAFRA has initiated Product Certification Scheme.

Product certification is the provision of assessment and impartial third-party attestation that fulfilment of specified requirements has been demonstrated. Product certification is carried out by product certification bodies which should conform to ISO/IEC 17065-2012. Product certification is an established conformity assessment activity that provides confidence to consumers, regulators, industries and other interested parties that products conform to specified requirements such as product performance, safety, interoperability and sustainability.

Product certification is an important pre-requisite for food establishments who intend to export products for regional and international markets. Having ISO 22000 FSMS ensures greater chances of getting the product easily certified under BAFRA's Product Certification Scheme. ISO 22000 FSMS certification demonstrates the ongoing commitment to food safety, proves the integrity to the market, and enhances consumer confidence in the brand.

*Contributed By Sonam Deki*

## Fumigation treatment facility and simulation exercise in Phuentsholing

**B**hutan has been witnessing increased trade volume of plants and plant products including wood packaging materials over the years. Such trade has associated risks which serve as a pathway for

measures, BAFRA has introduced fumigation treatment facility at the two major Entry Points viz; Phuentsholing and Gelephu. These fumigation facilities will strengthen the phytosanitary measures by preventing entry, establishment and spread of exotic pests and diseases by exterminating the pests associated with plant and plant products. Phytosanitary measures such as fumigation of plant and plant products is a mandatory requirement to facilitate international trade. BAFRA had organized stakeholders workshop on 15th December 2017 to discuss on the development of a Roadmap for Fumigation Treatment in Bhutan. Representatives from various Departments and Agencies under MoAF participated in the workshop facilitated by two fumigation experts from India. A two-day simulation exercise on fumigation treatment was conducted from 16th - 17th December 2017 at Phuntsholing. The Director General, BAFRA graced the training program, along with 22 BAFRA inspectors which included 7 inspectors adequately trained in fumigation techniques from the National Institute for Plant Health Management, NIPHM, Hyderabad, India.



introduction and spread of plant pests. Hence, it is imperative to impose restriction on the movement of pest-infested plants and plant materials through the establishment and implementation of border control and quarantine measures which can aid in preventing or, limiting the introduction of quarantine pests.

Currently, the import and export of plants and plant products requiring treatment are provided with basic chemical treatment such as fungicides or insecticides by BAFRA inspectors. To step up phytosanitary

*Contributed By: Sonam Yonten*

## Orientation of BAFRA field Officials for implementation of Food Business Licensing

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BAFRA has organized a five day Orientation Workshop on Environmental Food Safety Risk Assessment for Licensing of Food Business from 8-12 January 2018 in Punakha. 35 BAFRA officials consisting of Officer In-Charges, Base In-charges and food inspectors from BAFRA field offices and focal officials from BAFRA, Head Office attended the workshop. The objective of the workshop was to



orient the field officials in food safety licensing process, discuss the implementation issues and familiarize with the forms related to licensing process. The food safety measures such as the inspection of food establishment site to identify and prevent possible food safety hazards from the environment will help in addressing environmental contaminants of public health concerns. BAFRA has developed the GHP/GMP Criteria for Licensing of Food Business. However, BAFRA officials have not been adequately trained to implement the licensing process and field officials have come across various implementation issues. The workshop discussed such implementation issues and outlined the way forward for the effective implementation of Food Business Licensing Process. The workshop was funded by Bhutan Trust Fund for Environmental Conservation.

*Reported by: Kubir N. Bhattarai*

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## National Food Testing Laboratory (NFTL) Recognized by India dealing with Food Imports

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In the recent times, the Bhutanese Exporters have experienced the difficulties in exporting the Bhutanese products to India. The Test Reports issued for the products by NFTL, BAFRA was not accepted by the Indian Authorities at the border and the consignment were usually held up for days. To solve these issues and to help facilitate trade, NFTL, BAFRA has applied for recognition by Food Safety and Standards

Authority of India (FSSAI) in November 2017. NFTL, being accredited with ISO/IEC 17025: 2005 standard by the National Accreditation Board for Testing and Calibration Laboratories (NABL), India, was helpful in applying for such recognition. On February 6, 2018, FSSAI had issued an order recognizing the certificates issued by NFTL for any food and agriculture products export to India.

*Contributed by: Dechen Wangmo*

## Antimicrobial Drug Residue in Imported Pork

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The Antimicrobial drugs are mostly used in treatment and prevention of diseases, or as feed additives to improve the performance of farm animals. The antimicrobial residues are observed in all kind of meat, if the withdrawal periods are not observed before slaughter. Bhutan imported 2200 metric tons of pork (i.e. 90% of total pork consumption) annually from India. The objective of the study was to determine the antimicrobial residues and compare the prevalence of residues in muscle of imported pork. A total of 80 samples (10 grams of pork muscle) of imported pork were collected randomly from Phuentsholing and Samdrup Jongkhar.

The samples were packaged in zip lock polythene bags with proper labeling and stored at 2-4°C and tested at National Food Testing Laboratory, Yusipang, Thimphu for antimicrobial residue. Determination of residual presence and concentration level of Sulphamethazine, Sulphadiazine, sulphaquinoxaline and Oxytetracycline was carried out by using RANDOX® ELISA (Enzyme-Linked Immunosorbent Assay). The samples tested positive for sulphamethazine, sulphadiazine and sulphaquinoxaline residues using RANDOX® ELISA (Enzyme-Linked Immunosorbent Assay) from both study sites. However, the same samples tested negative for oxytetracycline residue. Sulphadiazine has the

highest prevalence with 92.5% and Sulphaquinoxaline has the lowest prevalence residue with 55%. The range of concentration of sulphadiazine residue is from 0.21- 15.73 ppb, sulphamethazine 0.23- 14.53 ppb and sulphaquinoxaline 0.05 - 12.62 ppb which is much lower than the Maximum Residual Limit (MRL) set for sulpha drugs.

An overall prevalent rate of 92.5% antimicrobial residues for sulpha drugs in imported pork is alarming because it indicates that the pig farmers use these drugs inadvertently as an additive to increase the production. The antimicrobial residues in food is a major public health concern as it results in the development of antimicrobial drug resistance, hypersensitivity reaction, carcinogenicity, mutagenicity, teratogenicity, and disruption of intestinal normal flora. There is a limited information on the magnitude of antimicrobial residues in food worldwide which require an extensive research to determine the magnitude of the problem to prevent occurrence of antimicrobial drugs residues. It is also to educate farmers and veterinarians on the toxicological effects to minimize the potential public health hazards due to drug residues in food of animal origin.

Contributed by: Rinzin Wangchuk

## H5N1 Outbreak in Samdrup Jongkhar

Following the report of death of Tshethar poultry in Zangtopelri Lhaxhang in Samdrup Jongkhar on 7 March 2018, the joint investigation was conducted by Department of Livestock (DoL) and BAFRA which tested positive to Influenza A by rapid test kit. The post mortem lesions showed pathognomonic to Highly Pathogenic Avian Influenza (H5N1). The samples were referred to



National Centre for Animal Health (NCAH), Serbithang which confirmed to HPAI (H5N1) by RT-PCR. In line to the National Influenza Pandemic Plan 2014, the National Incident Command Committee (NICC) was convened on 12 March 2018. The NICC authorized the activation of Incident

Operation Center (IOC) at District Veterinary Hospital, Samdrup Jongkhar to implement the disease containment measures. Accordingly, various Rapid Response Team (RRT) was formed comprising of officials from DoL, BAFRA, Health, RBP and Dzongkhag.

In total, 49 pigeons and 36 tshethar poultry mortalities were reported from two epicentres (Zangtopelri & Pinchina). Considering the risk of disease spread to other susceptible poultry and to prevent spread to humans, a 3D operation (Depopulation, Disposal & Disinfection) was conducted. During the operation, 24 infected Tshethar birds were culled. The surveillance team covered 1672 poultry and 1940 pigeons in the surveillance zone which were screened for HPAI (H5N1) using rapid test kits. None of the samples tested positive by rapid test. Two disinfection point were established at Samdrup Jongkhar and Pinchina gates for disinfection of vehicles. The BAFRA officials were placed at various check points to monitor the movement of poultry and poultry products out of the infected zone. A signage on bird flu outbreak was erected at strategic point and mass public awareness were carried out.

After implementing control measures, no poultry mortalities and suspected cases of HPAI in human have been reported. Currently, the outbreak investigation is ongoing to determine the source of outbreak.

Contributed By; Dr Sherub Phuentshok

## CONSULTATIVE WORKSHOP ON GUIDELINES ON ANIMAL TSHETHAR PRACTICES IN BHUTAN

Tshethar means a religious practice in Buddhist society where animals are rescued and freed from being slaughtered. The Tshethar practices are imbedded in the Bhutanese culture so strongly that animals can be seen with colorful scarf hanging from their neck for life. This is done with strong religious beliefs that taking the compassionate action of saving beings from death creates positivity to clear obstacles, heal, and purify karma whom this practice is dedicated, in this life or after death. Yak, cattle, goat, pig, poultry and fish are purchased from slaughter, or less dramatically, through an arrangement with a butcher who promises not to kill animal for life. After the animals are identified and saved, monks perform blessing ceremony that dedicates this meritorious action for the benefit and

happiness of all involved, and extending it outward, to all the sentient. The Tshethar animals are then kept in a private enclosure or released in an environment with no care.

The Guidelines on Animal Tshethar Practices in Bhutan was jointly developed by the Department of Livestock (DoL) and BAFRA with the objective of streamlining the Tshethar activity. A One day “Consultative Workshop on Guideline on Animal Tshethar Practices” was convened on 12 January 2018. There were 48 participants representing communities of Paro & Thimphu (local leaders), registered Tshethar Tshogpas, and representative from DoL and BAFRA. The objectives of the workshop were to carryout



consultation on the guideline and create awareness to the Tshethar practitioners and local leaders. Broadly the guideline covers the a) Registration of Tshethar Tshogpa, b) Facility for animal shelter, c) Health care and management, d) Animal Welfare and Fines and Penalties. Overall, the participants supported for the need of such guideline to curb issues related to Tshethar animals and promote animal welfare. The guideline will be presented to the RNR – GNHC for endorsement.

*Contributed By:  
Dr Kuenzang Gyeltshen*

## Dog import in Bhutan

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**T**he relationship between dog and humans have changed over time in Bhutan. Earlier, Bhutanese people domesticated dog to guard their properties against animals.e. Now, people raise dog as a pet for varied reasons viz; physical, emotional and social benefits. For some, keeping dog at home is a privilege and for other it is like their family.

The Livestock Rules & Regulation of Bhutan 2018 permits the import of dog by any individuals but only with Prior Import Permit from BAFRA. The requirement of Prior Import Permit is to ensure that animal coming into the country is free from exotic diseases and other zoonotic diseases. The import permit can be availed from all BAFRA offices in the country.

The import of dogs has increased significantly from 2016 onwards. As per the data from Bhutan Biosecurity System which is web based maintained by BAFRA, 144 dogs were imported from 2016 to 2017. The most common breed of dog imported was Spitz (21.5%) followed by Pug (10%) and Alaskan Husky breed (9.5%). The other breeds of dog imported were Pomeranian, German Shepard, Shih Tsu, Golden Retriever, Labrador Retriever, Boxer,Persian, Deschund, Beagle, Apsoo, Siberian Husky, Tibetan Mastiff, Great



Dean, Saint Bernard and Chihuahua. The majority of the dogs were imported from India (52.1%) followed by Thailand (30.6%). The dogs were also imported from Bangladesh, Nepal, Germany and USA. About 55.5% of the dog were imported via Airplane through Paro International Airport and remaining were via road through Phuntsholing entry gates. As per the record maintained, the majority of the Import permit services were provided by Thimphu BAFRA office (45.14%) followed by Paro (26.4%) and Phuntsholing (16%). The other import permit services were given by Punakha, Tsirang, Haa & Bumthang. For the rest of the districts, either the public were not aware of such services or people are not in favour of importing dogs.

*Contributed by: Prakash Tamang*



# Prevalence of Salmonella in dressed Broiler carcasses and their susceptibility to antibiotics

Salmonella is an important zoonotic pathogen of economic significance in animals and humans. Mostly poultry meat is the main source of infections in humans. In Bhutan, chicken is produced under poor hygiene environment due to lack of proper meat processing plant. Therefore, the food safety concerning broiler meat is of great public health concern in the country. A cross sectional study was conducted. The objectives were to a) determine the prevalence of Salmonella and its serotypes in locally produced chicken and b) to determine the susceptibility of Salmonella to panel of antibiotics. A total of 180 breast muscle samples were collected from five commercial broiler farms in Samphelling and Darla



gewogs in Chukha. The samples were subjected to culture and identification of Salmonella using ISO 6579: 2002 method. Salmonella isolates were then subjected to Antibiotic Sensitivity Test (AST) using CLSI 2000 guidelines. The overall farm prevalence of Salmonella was  $12.78 \pm 4.21$  (n=180) with a prevalence of  $13.89 \pm 3.93\%$  (n=144) in Samphelling gewog and  $8.33 \pm 0.10\%$  (n=36) in Darla gewog. The most common types of Salmonella species isolated from the study area were *Salmonella Typhimurium*

(73.9%) and *Salmonella Paratyphimurium* type B (26.1%). The AST for 23 isolates of Salmonella species showed highest sensitivity to Gentamicin with 73.9% followed by Streptomycin (56.5%), and Ampicillin (47.8).

Similarly, the result showed highest resistance to Tetracycline with 95.6% followed by Trimethoprim 86.9% and Amoxycillin 65.2%.

The findings underscored the need to improve the hygiene and sanitation in the commercial broiler farms. Therefore appropriate use of antibiotics to treat Salmonellosis in order to ensure safe food to the consumers in the country, must be advocated with proper monitoring.

Contributed By:

Monu Guring

## GMO Surveillance in Animal Feed

**B**iosafety Act of Bhutan 2015 defines Genetically Modified Organism (GMO) as an organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology techniques. The Act designates Bhutan Agriculture and Food Regulatory Authority (BAFRA), as the national competent authority for the implementation and enforcement of Biosafety related activities in the Country. The Act strictly prohibits the import and transit of any genetically modified organism or biologicals capable of reproducing. In addition, research and



development which involves GMO capable of reproducing are also prohibited.

Surveillance on GMO element in feed was carried out from March to June 2017. Thirty six numbers of feed samples were collected from Gasa, Gelephu, Mongar, Phuntsholing, Tashigang, Thimphu and Tsirang. These

samples were tested at National Food Testing Laboratory (NFTL) by using qPCR. The DNeasy® Plant Mini kit (250) manufactured by Qiagen, Germany was used to extract DNA from feed samples. For this surveillance study, CTAB/Qiagen method is deployed where CTAB extraction buffer is used instead of AP1 buffer and Proteinase. PCR was performed in replicates of two for every DNA sample. The DNA samples were analyzed using qPCR to assess the presence of GMO events in the animal feed and quantify the level of GMO content.

The feed samples were analyzed for 12 GMO events. Few samples tested positive to barstar and neomycin phosphotransferase II gene (nptII). The gen barstar is derived from *Bacillus amyloliquefaciens* with the GMO trait to restore fertility by repressing the inhibitory effect of barnase on tapetum cells of the anther. The neomycin phosphotransferase II enzyme (nptII) gene is derived from *Escherichia coli* Tn5 transposon with the GMO trait to allow transformed plants to metabolize neomycin and kanamycin antibiotics during selection. However this warrants further analysis with raw materials after thorough cleaning as this signal may possibly be from bacteria. This will rule out any false positive.

Contributed by: Jambay Dorji

## Report on Mandarin (*Citrus reticulata*) Export Activities in 2017-2018 Season

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**M**andarin is one of the major cash crops of Bhutan and is leading in terms of volume for export to Bangladesh which generates export revenue, cash income and creates employment opportunities thereby contributing to Bhutan's economy. In the year 2017-2018, the export of mandarin commenced from 25th November 2017 to January 2018. The mandarin yield dropped this year by almost 60% to 70% as compared to the previous year as per the exporters.

Citrus greening *Liberobacter asiaticum* or Huanglongbing (HLB) is the leading cause for decline in citrus industry in Bhutan. The other factors contributing to low mandarin yield are fruit drop caused by citrus fruit fly, damage by powdery mildew, poor management practices, etc. And also fruit damage by fungal disease called sooty mould (*Capnodium citri*) and parameters such as thickness of the rind, taste and size of the fruit that determined the quality and price of the fruit was also found to be different from different sources. The mandarins exported were from areas such as Logchina, Darla, Tsirang, Dagana, Pemagatshel, Panbang, Nganglam, Mongar, Trashigang and Trashiyangtse.

For mandarin export, BAFRA officials carry out certification in line to the technical



standard to assure the quality and facilitate trade. Every consignment is inspected and certified as per the prescribed standards. A 10% of the samples from each truckload or consignment are randomly drawn and inspected for color, size, physical defects and pests/diseases infestation and packed in wooden boxes into two sizes i.e. big (meel) and small (keel), and fetches corresponding price. A total of 2085.155 MT of fresh mandarin were exported to Bangladesh and 109.36 MT to India of worth USD 973197 and USD 8179.737 respectively in the year 2017-2018. The highest exporter of mandarin to Bangladesh in terms of volume and value among 6 exporters were DrukPhuensum Export & Import House followed by Peling Export and Pelden Export and least was exported by Manu Export.

*Contributed by: Om Prakash Ghalley*

## BAFRA's Plan to Streamline Food Imports Might See Smooth Sailing

**B**hutan Agriculture and Food Regulatory Authority (BAFRA), MoAF has moved a step closer to streamlining food imports into Bhutan by hosting high level delegations from Export Inspection Council (EIC), Ministry of Commerce & Industry, India for a Joint Review Meeting held on 22nd January 2018.



Memorandum of Understanding (MoU) was signed between BAFRA and the EIC on 27th September 2013 to regulate quality and safety of foods and agriculture product imports from India. As per the MoU signed, EIC will inspect and certify foods and agriculture products exported to Bhutan from India based on BAFRA's requirements and Bhutan's national standards. To take forward implementation of the MoU, stakeholder consultation/ sensitization meetings were held. Bhutanese importers and their counterpart Indian suppliers were given sufficient time to prepare themselves to comply to this new requirement and starting 2017, BAFRA and EIC implemented the certification requirements for export of dry fish and frozen chicken from India to Bhutan. To review the progress of implementation of activities under the MoU and further extend EIC's collaboration to regulate other high-risk food and agriculture product imports to Bhutan, the Joint Review Meeting between the two agencies was held on 22nd January 2018 in BAFRA Conference Hall, Thimphu.

In the meeting, lot of important issues that are of interests to both the agencies were discussed and time-bound action plan prepared for implementation of the recommendations. If both the agencies could implement the recommendations of the meeting, BAFRA's ambitious plan to streamline and implement Food Import Control system could see a smooth sailing. BAFRA and EIC agreed to together towards developing inspection and certification system for the commodities that require compulsory pre-shipment inspection & certification prior to export under the EIC's Act in addition to dry fish and frozen chicken which has already been

implemented. Recognizing the need of NFTL and to have easy access to technical backstopping, the EIC has agreed to extend best possible support to NFTL by participation of NFTL in proficiency testing with EIA labs at Kolkata/ Chennai/ Mumbai as these labs have been recently accredited as per ISO 17043 as PT providers. BAFRA will also work toward recognizing EIA-Kochi Laboratory as Reference Lab for them for GMO matters. Both FSSAI and EIC have mandates to assure food quality and safety in India and are important part of National Food Control System. As per request of BAFRA, the EIC will assist BAFRA in establishing linkage with FSSAI and a communication will be sent to FSSAI in this regard.

Meeting ended with both the organizations thanking each other for the support and cooperation extended to each other for mutual benefit and assured similar cooperation from both the sides.

*Contributed By: Dr Chador Wangdi*

## Pesticide Residue Monitoring in Fresh Fruits and Vegetables

BAFRA has been carrying out regular surveillance and tests on pesticide contents in the imported vegetable through use of Rapid Test Kits and Laboratory testing to ensure food safety. Following the positive test results using Rapid Test Kits in imported vegetables, the samples were subcontracted to the Reference Laboratories in India and Thailand. The results from reference laboratories confirmed the high content of residues in chillies, beans and cauliflowers to four Groups of pesticides

above maximum permissible limits (MRLs)

The Technical Task-force was constituted within the ministry to study the report submitted by BAFRA.

Subsequently, the import of beans and cauliflower was temporarily banned w.e.f 20 May 2016 as per the recommendations of Task Force. After the repeated positive tests of the pesticide residues in imported chillies by Rapid Test Kits, the samples were referred to Export Inspection Agency Laboratory, India. As per the laboratory report, all the chilli

varieties were detected with 4-Bromo-2-Chlorophenol above the MRL and import of chillies from India was temporarily banned w.e.f: 21 July 2016.

Since the ban, BAFRA has been continuously monitoring the pesticide residues in fresh vegetables by sampling vegetables in the local markets. Furthermore, the illegally imported vegetables intercepted by BAFRA were also tested for pesticide content. The temporary ban on these vegetables is still enforced.

*Contributed By: Sonam Tobgay*

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