



Department of Agriculture
**Bureau of Agriculture
and Fisheries Standards**
BPI Compound, Visayas Avenue, Diliman,
Quezon City 1101 Philippines



TECHNICAL BULLETIN

- 2019 -

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Recommended Citation:

Bureau of Agriculture and Fisheries Standards. 2019. *Technical Bulletin*. Quezon City, BAFS.

Technical Bulletin is an annual publication of the Department of Agriculture - Bureau of Agriculture and Fisheries Standards.

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ISSN 2719-1982 (Online)

www.bafs.da.gov.ph



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Date Published: 2019/12/01

Issue

BUKBOK-INFESTED RICE

Background

Last August 2018, at least 330,000 sacks of imported milled rice were reported to be infested with buk bok or weevil. The Bureau of Plant Industry-Plant Quarantine Services through the National Food Authority (NFA) said that the rice will be fumigated to combat the pest while assuring the public that it is safe for consumption specifically if washed before cooking. Among the registered fumigants in the Fertilizer and Pesticide Authority (FPA) used for rice are phosphine and methyl bromide.

According to the 2015-2016 Food Consumption Survey of the Philippine Statistics Authority (PSA), a typical Filipino consumes an average of 109.875 kilos of rice in a year. Rice as a staple food in every Filipino meal provides complex carbohydrates, protein, fat and other nutrients such as magnesium, phosphorus, manganese, selenium, iron, folic acid, thiamine and niacin.

General Description

Rice

Scientific name: *Oryza sativa* L.

Brown to white starchy cereal grain depending on the degree of milling undertaken. Prepared by washing the rice once or twice before cooking in a pot with the right proportion of water. Boiled and simmered in reduced heat until cooked.

Bukbok

English name: Weevil; Scientific name: *Sitophilus spp.*

Weevil is one of the major insect pests that are capable of extensive damage not only in rice but also other grain-based products. An adult weevil can grow 2.3-5mm long. This dull red-brown to black small snout weevil is characterized with four red to yellow spots on its back. The larval stage which feeds on the interior of the grain is white, small, fleshy, legless body with brown head.

Fumigants

A. Phosphine

Pure form of phosphine or hydrogen phosphide is a colorless and odorless gas. But, its technical grade form but smells 'garlicky' and 'fishy' due to impurities or presence of other compounds added to regulate gas release. Phosphine as a fumigant is liberated by the reaction of stable salt, such as magnesium phosphide or aluminum phosphide, with water vapor in the surrounding air.

B. Methyl Bromide

Methyl bromide is a colorless, highly volatile gas. It is odorless at low concentrations but sweetish chloroform-like or strong musty odor at high concentrations.

**Health and Food Hazard**

Although weevils are medically harmless both to human and animals, these small snout weevils feed directly and lays egg inside rice grains which causes holes and a subsequent decrease in the weight of grain and market value of rice.

Fumigants such as phosphine and methyl bromide are registered pest control for rice under the Fertilizer and Pesticide Authority (FPA). Phosphine minimum exposure is 7 days while methyl bromide requires at least 48 hours. Phosphine ventilation and withholding period is a minimum of 12 hours and 2 days respectively. Methyl bromide ventilation requires a longer time versus phosphine but the same number of days for withholding period. A specific dosage for a certain exposure period are employed and maintained to destroy grain pests in all their life stages (egg, larvae, pupa and adult) and prevent insect resistance.

As per FPA Circular No. 4, Series of 1989, methyl bromide and phosphine are classified as restricted pesticides thus, must “provide adequate time for aeration after treatment before commodities are processed into food or feed”. The international standard (Codex) has set a maximum residue level (MRL) of inorganic bromide in rice at 50 mg kg⁻¹ and hydrogen phosphide at 0.1 mg kg⁻¹.

Health risks associated to methyl bromide and phosphine are inhalation and exposure at high concentrations during fumigation activities.

Risk Mitigation

Quality rice have whole grains with no perceivable off-smell and presence of other seeds or foreign materials.

To ensure food safety, store rice in a clean and tightly covered container. Wash rice thoroughly before cooking.

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Number: 02

Date Published: 2019/12/01

Issue	Formalin-tainted Galunggong
Background	<p>In August 2018, a fisher folk group claimed that one of the sources of imported galunggong imports uses formalin to preserve fish harvests. The Bureau of Fisheries and Aquatic Resources (BFAR) assured the public that all fish commodities available in the markets are safe and free from any harmful substances.</p> <p>The Food and Nutrition Research Institute (FNRI) reported that in 2015, 11.9% of the total food intake of households comes from fish and fish products. Among the commonly consumed fresh fish, is galunggong (10.3% of household), followed by bangus, tilapia and tulungan with 9.3 %, 8.7 % and 7.8 % of household consumption, respectively.</p> <p>Fish is part of the typical diet of every Filipino as it is a source of high quality protein and it is low in saturated fat. Fish is also loaded with important nutrients and best source of omega-3 fatty acids.</p>
General Description	<p><u>Galunggong</u></p> <p>English name: roundscad; Scientific name: <i>Decapterus punctatus</i>. Roundscads live primarily in midwater or near bottom in shallow water to about 100 m.</p> <p><u>Formaldehyde</u></p> <p>A colorless, readily soluble in water, highly flammable gas that is sold commercially as a 30-50% (by weight) aqueous solution. Formalin is the most common solution of formaldehyde which has antibacterial properties and is commonly being used in health care products and as an industrial fungicide, germicide and disinfectant. It is also widely being used as tissue preservative and disinfectant in embalming fluids.</p>
Formaldehyde in Food	<p>Formaldehyde is a natural component of various food in which the highest concentrations (i.e. up to 60 mg/kg) occur in some fruits (e.g. orange, pear and banana) and marine fish. While formaldehyde forms postmortem in fish, it does not accumulate in high levels in fish tissues. Formaldehyde is also being used in fumigation (e.g. grain), as a bacteriostatic agent (e.g. cheese) and in the animal feed industry to improve handling characteristics.</p> <p>The World Health Organization (WHO) reported that formalin solution has been used by some fish handlers as fish preservative. Fish preserved with formalin usually has lost muscle tenderness, has blackened gills and whitish eyes. Ingestion of formalin in significant amount can lead to harmful consequences. Thus, fish preserved with formalin may not be fit for human consumption.</p> <p>Basically, formaldehyde may be present in food, either naturally in small amounts, as an additive, or as a result of contamination or fraud.</p>
Adverse Health Effect	<p>The Tolerable Daily Intake (TDI) for formaldehyde is 0.15mg/kg body weight. The WHO established the TDI which is the estimated amount for a substance that can be ingested daily over a lifetime without appreciable risk.</p> <p>In over a decade, many researches reported that formaldehyde has a potential to cause cancer. The International Agency for Research on Cancer (IARC) classified</p>



formaldehyde as carcinogenic to humans, based mainly on epidemiological evidence from occupational exposures in industrial workers.

Ingestion of a small amount (30 mL or 1 oz) of a solution containing 37% of formaldehyde can cause acute toxicity exemplified by severe abdominal pain, vomiting, bleeding and possible death.

Risk Mitigation

How to recognize fresh fish?

1. Fresh fish has firm flesh, a stiff body, tight scales, red gills and bright eyes.
2. Once you press the body, no indentation should be left.
3. Purchase select fresh fish stored on ice or refrigerated and those that are not slippery or slimy to touch.

What can consumers do?

1. Wash the fish thoroughly with running tap water, as formaldehyde is soluble in water and washing can aid the removal of formaldehyde.
2. Cook the fish thoroughly since heat from cooking can also aid the removal of formaldehyde.

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Number: 03
Date Published: 2019/12/01

Issue	AFRICAN SWINE FEVER
Background	<p>In August 3, 2018, the first African Swine Fever (ASF) case in Asia was reported in China, causing worries to the local hog raisers of the country. Swill feeding was identified to be related to the 62% of first 21 ASF cases in China [1]. In order to protect the local industry, the Bureau of Animal Industry (BAI) has released a Technical Advisory regarding the temporary ban of importing domestic and wild pigs, their products and semen from 24 countries infected with ASF including Belgium, Bulgaria, Cambodia, China, Czech Republic, Hong Kong, Hungary, Laos, Latvia, North Korea, Moldova, Mongolia, Myanmar, Poland, Romania, Russia, Serbia, South Africa, South Korea, Ukraine, Vietnam and Zambia. Belgium [2]. The use of catering food wastes from airports and seaports as swill feed was also prohibited by BAI. Several local ordinances were issued as well by local government units to ensure control of ASF virus spread.</p> <p>Swine is either domestic or wild and considered source of pork meat. There were about 769.06 million pigs observed worldwide with global per capita consumption of 12.3 kilograms in 2018. People's Republic of China was identified as the highest pork eater having a per capita consumption of 30.4 kilograms [3].</p> <p>Locally, swine is considered one of the important protein source of Filipinos. In 2009, the pork consumption per capita in the Philippines was 14.25 kilograms and become 15.61 kilograms in 2018. For 2020, it is forecasted to be 15.96 kilogram per person annually [4].</p>
General Description	<p><u>Swine</u> English name: domestic pig, hog;; Scientific name: <i>Sus scrofa domesticus</i>. Raised and produced globally. Its meat and by-products are often consumed and considered source of dietary protein.</p> <p><u>African Swine Fever</u> African swine fever is a viral disease affecting porcine species such as pigs and wild boars. Clinical signs include fever and functional disorders of the digestive and respiratory system. This is caused by ASF virus, a large double-stranded DNA virus under the Asfarviridae family. [5] This virus replicates mainly in the cell cytoplasm and has ASFV CD2-like protein which causes the red blood cells to bind to extracellular virions and infected cells causing virus dissemination and persistence [6]. There are no known treatment and vaccine developed as to date.</p> <p><u>ASF Virus persistence and stability [7]</u> Temperature: 60 °C and below (resistant to very low temperature)</p> <p>pH level: 4 to 11</p> <p>Remains viable for long periods in blood, feces and tissues including infected uncooked or undercooked pork products.</p> <p><u>Transmission [8]</u> Known route of transmission are through:</p> <ul style="list-style-type: none">a) direct contact with infected animals;b) indirect contact through:



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- vector such as soft tick (*Ornithodoros spp*); and
- slurry;
- swill feeding (with infected tissues including meat);
- vehicles and other fomites, clothing, footwear, surgical equipment; and
- genetic material.

African Swine Fever in Food

The disease is not infectious to human. However, the virus can persist in blood, meat (both raw, cooked and processed) and other unhygienic farm implements that could lead to possible spread of disease to porcine species [7].

Animal Product	Product/Meat	Process	ASF virus infectivity
	Blood	Stored at 4°C	1.5 years
	Boned meat	Stored at 4°C	150 days
	Frozen meat	Kept at -18°C	1000 days
	Parma ham	24 months of curing, drying, fermentation and ripening	400 days
	Meat in hermetically sealed container (meat loaf, luncheon meat, canned sausage, corned meat if canned) [9]	Meat placed in containers designed and intended to secure the products from entry of microorganisms including spores. Meat products should be subjected to sterilization conditions i.e 121°C for 3 minutes.	Virus is inactivated if strictly followed.
	Dry cured salami [10]	Minced meat blended with ingredients (salt, aromas, lactose, spices, sucrose, milk powder, antioxidants, preservatives)	30 days
	Corned meat [10]	Pre-cooking in continuous cooking lines then mixed with spices and curing salt. Stored at 4-6 °C	60 days
	Dry cured pork belly and loin [10]	Spread with salt, black pepper, antioxidant and preservatives	83 days
	Pepperoni sausage [11]	Ground meat thoroughly mixed with recommended amounts of spices and pepperoni pepper kept for 48 hours at 4°C. Mixture was placed in to casing and kept at 20°C with relative humidity of 60% for 2 days. Then subject to smoking chamber (32 to 34°C).	30 days

There are no formal studies conducted for other local meat products such as hotdogs, tocino and longanisa, although recent findings by Bureau of Animal Industry showed positive results of ASF virus in confiscated products [12].

Adverse Health Effect

No known adverse effect to human.

Risk Mitigation

How to inactivate the ASF virus?

1. Disinfection [7]
 - a. Non-porous surfaces: Sodium hypochlorite, citric acid (1%) and quaternary ammonium compounds
 - b. Wood: 2% citric acid and sodium hypochlorite at higher concentrations
 - c. Other chemicals: 0.8% Sodium hydroxide (30 minutes); 2.3% chlorine (30 minutes); 0.3% formalin (30 minutes)
2. Heating/Cooking [9]
 - a. Unprocessed meat: at least 70°C for 30 minutes throughout the meat
 - b. Serum and body fluids: at least 60°C for 30 minutes
 - c. Swill feeds: at least 90 °C for at least 60 minutes with continuous stirring



3. Curing and Drying [9]
 - a. Meat should be cured with salt and dried for a minimum of six (6) months
4. pH level of serum-free medium: <3.9 or >11.5 [13]

What should raisers do?

1. Implement good animal husbandry practices (GAHP)
2. Report any unusual mortalities of swine in the farm
3. Ensure that people, vehicle and/or equipment have undergone proper cleaning and disinfection

What can consumers do?

1. Disinfect kitchen utensils and other domestic implements to avoid spread of virus.
2. Cook pork thoroughly as the recommended temperature has been found to help inactivate the virus.

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