

The electronic responses to this examination are due on Monday, 15 June 2015 at end of day (5:00 pm). Submit them to shalloran@lifewest.edu OR to smhbizness@gmail.com. You will be sent an acknowledgement receipt.

A. Environmental Toxicants. Pesticides-Insecticides: organophosphates

These are found worldwide and inhibit acetylcholinesterase which leads to accumulation of excess acetylcholine. Very common in US as agricultural insecticide. These are used to kill pests or things that society deems harmful. Several of these are nerve agents that the military created. Some examples of agents are: Carbochol, neostigmine and echothiophate. Echothiophate covalently binds with the phosphate group to the active site of ACHE. Making the enzyme permanently inactive. The new phosphorylated enzyme releases an ethyl group which makes it so that chemical re-activators cannot break this bond. It is typically used as a topical for open-angle glaucoma but can cause cataracts. Toxicity signs show up as muscarinic and nicotinic symptoms. (lippincott)

B. Food Toxicants: Sulfur dioxide (SO₂)

“At room temperature, sulfur dioxide is a nonflammable, colorless gas with a very strong, pungent odor...It is handled and transported as a liquefied compressed gas. It easily dissolves in water...Although sulfur dioxide does not burn in air, cylinders of compressed liquid can explode in the heat of a fire.” Asthmatics can get bronchospasm from ingesting this toxicant found in the wine. “Chronic exposure can result in an altered sense of smell (including increased tolerance to low levels of sulfur dioxide), increased susceptibility to respiratory infections, symptoms of chronic bronchitis, and accelerated decline in pulmonary function. Chronic exposure may be more serious for children because of their potential longer life span.” (ASTDR). High doses in wine can lead to severe hangovers. There is such a potent smell that will alter the taste of the wine. There are many effects that this compound has on wine according to Radikon:” 1)Antiseptic effect: the main two antiseptic effects of sulphur dioxide are the selection on must microflora and the antimicrobial action for wines preservation.

- 2)Antioxidant effect: sulphur dioxide compounds catalizators with dissolved oxygen: this reaction protects wine from chemical oxidations as e.g. some polyphenols or some aromatic essences oxidation.
- 3)Antioxidasic effect: sulphur dioxide inhibits the action of oxidase enzymes in the must and sometimes totally destroys them. Must is therefore protected from prefermentative oxidations.
- 4) Solubilisation: sulphur dioxide, coming in contact with grape skins, helps along the diffusion of less polymerized colouring substances from the cells through little holes on the cell walls. In so doing, it also helps the anthocyanins outflow.
- 5)Mixer: a wise use of SO₂ improves wine fragrance and taste, because this preservative combines with some substances with unpleasant smell or taste, as acetaldehyde or pyruvic acid, that are no longer perceivable on taste.
- 6)Clarifier: SO₂ finally has a bland clarifying action, because it helps along coagulation of colloidal substances and increases the spontaneous fall of the wine bottoms.”

Red wines do not need any added because they have their own anti-oxidants. White wines have high doses added because the skin are not used with fermentation and so there is not anti-oxidant heavy properties. Some wines have already stopped using sulfur dioxide “when grapes are healthy, and in particular thanks to extraction or use of natural antioxidants as e.g. oak tannins, ellagic tannins from grape skins, proanthocyanidins from grape seeds and ascorbic acid (Vitamin C)” (radikon).

C. Drug-Nutrient Interactions.

Antacids, weak base that will react with gastric acid and forms salt and water. End result will decrease gastric acid. Pepsin is inactive with pH over 4 therefore it will decrease overall pepsin activity. There is a wide variety between different antacids. How it is digested is controlled heavily by the stomach being empty or full. Food will delay the stomach digestion giving the antacid more time for reaction to occur. Combinations of aluminum and magnesium are common. Along with sodium bicarbonate which will react with HCL is also common. This converts into carbon dioxide and calcium chloride. Metabolic alkalosis can occur with too much sodium bicarbonate. These should not be used long term. These are used to relief of GERD symptoms and peptic ulcer diseases. Common side effects include: diarrhea, constipation, hypophosphatemia, flatulence, belching and occasionally renal impairment. (lippincott)

D. Personal Care Products .

BeyondPesticides

Gillette® Complete Skin Care MultiGel Aerosol Shave Gel contains Triclosan. Triclosan is a “synthetic, broad-spectrum antimicrobial agent.”

“Triclosan is lipophilic, so it can bioaccumulate in fatty tissues.”

In regards to acute toxicity “there have been reports of contact dermatitis, or skin irritation, from exposure to triclosan. There is also evidence that triclosan may cause photoallergic contact dermatitis (PACD), which occurs when the part of the skin exposed to triclosan is also exposed to sunlight. PACD can cause an eczematous rash, usually on the face, neck, the back of the hands, and on the sun-exposed areas of the arms.” There are cases of immunotoxic and neurotoxic reactions.

Chronic toxicity of this product is not fully known. There are “Concerns over triclosan interfering with the body’s thyroid hormone metabolism led to a study that found that triclosan had a marked hypothermic effect, lowering the body temperature, and overall causing a “nonspecific depressant effect on the central nervous system” of mice.” Its most common health and environmental effects include: skin irritation, allergy susceptibility, bacteria and antibiotic resistance, dioxin contamination of aquatic ecosystems. Dioxin is carcinogenic and shown to cause decreased immune function, fertility, miscarriage and birth defects along with cancer. Study found that in water, triclosan can be converted into dioxin. The dermal LD50 for rats is 5000 mg/kg. The oral LD50 for rats is 4500–5000 mg/kg, for mice it is 4000 mg/kg, and for dogs it is over 5000 mg/kg. 22.

European countries are trying to warn population against using antibacterial hygiene products and household antibacterials for domestic everyday use. They are unnecessary and increase the likelihood of antibiotic resistance spreading. Hospitals and health care facilities and individuals with weakened immune systems. Using regular soaps are more than sufficient for bathing and shaving with.

References

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