Differences and similarities between veterinary and radioactive lab safety working practices

DIFFERENCES

1. *One of the major differences between a radioactive lab and a veterinary lab is the role and duties they perform. a veterinary lab performs certain functions such as: Molecular Diagnosis and Finding of Pathogen, Biochemical Analysis of Blood Samples , Tests for Poultry Blood & Egg ,Serological Tests on Livestock Blood and Milk. Whereas the function of the radioactive lab includes: assessing the importance and adverse effects of different radioactive substances, radioactive decays e.t.c*

2. *Radioactive labs use the ALARA (as low as reasonably achievable) principle in their day-to-day work with radioactive materials and radiation sources. It is when one strives to keep one's radiation exposure as low as reasonably. This is due to the fact that radioactive substances are primarily present in a radioactive lab and hence very harmful to lab workers whilst in the veterinary lab there is absence or minimal presence of radioactive elements and substances. their primary concerns are pathogenic organisms which are also harmful to humans and animal in the veterinary labs. Although there are ways of preventing transmission of pathogens to humans and animals in a vet lab, there is no principle applied to the prevention of pathogens.*

3. *In a radioactive lab there is heavy use of signs and symbols preventing intrusions by unauthorized personnel when working with loose ray materials due to the nature of radioactive rays such as alpha, beta, and gamma rays which when penetrated could lead to medical issues such as cancer, brain tumor.*

There is also a problem of build up of residual rays; this is when people are continually exposed to radioactive rays which when accumulated builds up causing serious health issues as mentioned. In the case of a veterinary lab they also make use of caution signs and symbols although not as heavy as that in a radioactive laboratory. This is to prevent the intrusion of unauthorized personnel and inflow of pathogens into the laboratory. The inflow of organisms and viruses could affect humans causing viral infections and could also affect animals that in turn mate and transfer the virus to opposite sexes.

4. *Radioactive labs allocate the use of radioactive material to a special room called the process area. This is to restrict the allowance of loose radioactive materials to as few locations within the lab as possible. This area is identified by defining the edge with caution tape or other obvious indication. The process area is used because it has coated absorbent paper on the lab bench to insulate the surface from contamination and limit the spread of spills. Activities of the veterinary lab are widespread. Hence test and analysis on animals are carried out in major parts of the lab and not just a special room.*

5. *Schools organise field trips and excursions for children as it has been proven that kids are more likely to learn by observation than theoretically. hence veterinary lab allow observation of the lab by children under supervision, whilst radioactive labs have been issued a policy which suggest that young children should not be allowed into a radioactive lab as the presence of beams, waves and rays may damage their developing brain cells*

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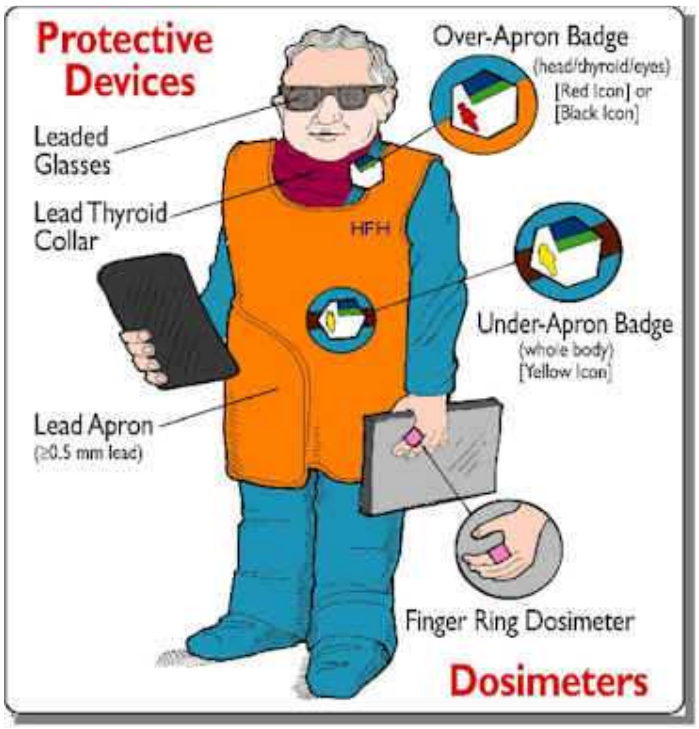
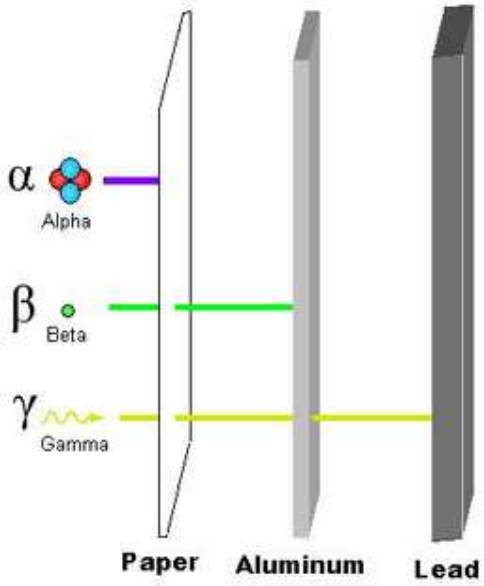
6. *In addition to the protective clothing guidelines in both labs, workers in the radioactive lab must wear leaded glass, over- apron badge, under apron badge, finger ring dosimeter lead apron. This alerts the individuals to certain degrees of beta, gamma and alpha radiation particles.*



Whilst in the veterinary lab, these excesses are not needed since the primary hazard is exposure to radiation. Since the highest penetrative radioactive substance is gamma rays, hence most of the protective clothing are padded with lead as this is the highest resistant of radioactive substances



SIMILARITIES

1. *In both labs protective apparels such as gloves, goggles, lab coats, closed shoes, are worn at all times. This serves to reduce exposure to harmful substance be it radioactive rays or pathogenic organisms to the barest minimum and also helps avoid spillage on the skin.*

GOGGLES WORN IN A RADIOACTIVE LAB

GOGGLES WORN IN A VETERINARY LAB

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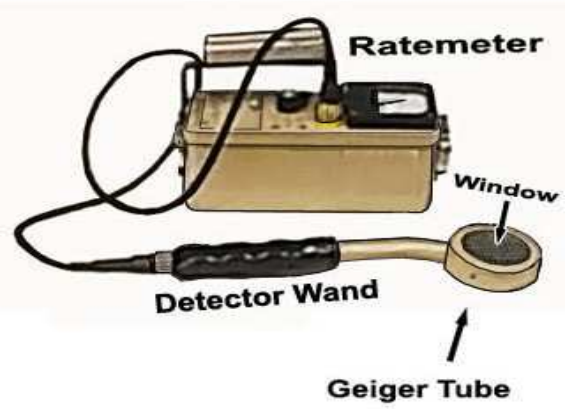
2. *In radioactive labs they make use of a device called the Geiger counter to determine the presence of radioactive rays and the types of ray although the penetration of the ray (hence the measurement) cannot be taken from these equipment. In the veterinary lab more accurate mechanism are set up to determine the types of pathogenic organisms present, features and the causal effects of each. These includes: QPCR Based Pathogen Detection and Micro array Based Pathogen Detection.*



GREIGER COUNTER *QPCR Based Pathogen Detection*

3. *Both lab keep inventory logs concerning issues, problems and records involved in their day to day dealings. In the case of a radioactive lab inventories are kept in the case of receipt dates, isotopes, activities and chemical form in addition each removal of radioactive material from the stock container must be indicated by noting the date of removal, the activity removed and the initials of the person removing the material. Whilst in veterinary labs inventory labs are kept concerning the drugs administered to animals, nutrition needs, blood analysis results, and receipts e.t.c. this is done for referral purposes.*

4. *Both labs prohibit the intake of foods, drinks and other digestible materials. They also prohibit smoking to prevent the transfer of toxic and harmful substances to the human body.*

5. *Both labs dispose wastes through means of incineration and decontamination before disposal.*

6. *Presence of eye bath and sinks in both labs. This serves as safety equipment in event of an accident like spillage and burns. It helps in minimising the risks and it is usually situated in a clearly visible area*

7. *Both labs are governed by central bodies that oversee and regulate the safety working practices in the lab. the governing body in charge of the veterinary lab is the veterinary laboratory agency (VLA) whilst the central body in charge of a radioactive lab is the radiation service association (RSO)*

8. *Both labs carry out health and safety courses. Before workers are recruited they are expected to pass courses in EH&S safety courses as it is compulsory for any worker working in the lab. Failure to do so may result in refusal of employment for the individual.*

Evaluation

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One criticism of a radioactive lab is that if the chemicals are not properly stored, it could lead to the accumulation of radioactive substance which leads to fatal health complications . this complications range from mild head aches to cancers and tumours. The time limit for the effects to be felt ranges from a second to an average of 30, 40 years. Although there has been invention of safety devices such as the Geiger Muller counter which helps in the reduction of hazards to the barest minimum. On the other hand there is evidence to show that certain radioactive element have been helpful in the treatment of certain ailments. They are also used for diagnosis and therapy. Hence scientist who work in a radioactive lab help in the discovery of new radioactive elements which may be beneficial in the treatment of human ailments and diseases.

whilst the interest in animal welfare could be attributed to the veterinarians who have raised public interest in the well being of animals and the creation of animal protection groups. They research treatment, nutrition and drugs needed by animals for survival. The major disadvantage of working in a vet lab is the transmission of diseases form animals to humans if proper safety procedures are not carried out. These diseases include rabies, foot and mouth disease, mad cow disease, bird flu (avian influenza)

Conclusion

Hence in conclusion both labs specialize in the improvement of living be it animals or humans and without them there would be a void which can not be filled. In the case of veterinary labs the problem of extinction could arise in their absence, and in the case of radioactive labs, restriction and diminishing of devices such as x- rays and other radioactive substances which aid in medical treatments could lead to mass death of humans and a return to history where science in general was ineffective.

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