

A NEWLY ESTABLISHED COURSE IN RADIATION PROTECTION FOR VETERINARY AND AGRICULTURAL POST-GRADUATES

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1. INTRODUCTION

The use of radioactive isotopes as tracers in veterinary and agricultural^{*)} science is becoming the rule rather than the exception. Consequently, an appropriate degree of radiation protection in these fields of research is increasingly important as a part of the general scheme of environmental protection.

Two years ago the physics courses given by our department were undergoing revision, and simultaneously we took the opportunity to re-consider the education of students in radiation protection. The outcome of the latter considerations was the introduction of a post-graduate course entitled "Health Physics and Isotope Hygiene". Before entering into description of this newly established course, a brief review of the foregoing history is presented.

2. THE ORIGINAL ISOTOPES COURSE

Once or twice annually from 1958 to 1972 we presented a course in isotope techniques to veterinary and agricultural post-graduates. An average of 12 students per year participated and the time allotted per course was about 90 hours of instruction evenly distributed between the lecture room and the laboratory. A general impression of the course curriculum may be obtained by conferring the subject matter given in the common basic part of several IAEA publications, the latest being the revised manual on crops and soils (1).

The main objectives of the course were (a) to instruct the participants in the use of isotopic tracers and (b) to train the participants in the handling of radioactive materials at the tracer level without undue risk to them-

*) "Agriculture" is used in this manuscript to cover agriculture as such, dairy-engineering, horticulture, food technology, and forestry.

selves or others. As a consequence of the second objective, the short chapter on radiation protection in the above-mentioned tracer manual was supplemented over the years with texts from other publications (2-4).

Upon completion of the course the participants underwent a written examination, the result of which was evaluated by The Lecturer in Charge and two Censors (a physicist and a health physicist). A diploma was issued to all participants who passed the examination.

3. AUTHORIZATION SYSTEM IN DENMARK

Normally, anyone in Denmark who wishes to use radioactive material must obtain permission from the appropriate Health Authority. The diploma mentioned above does not in itself constitute a legal licence. However, the diploma serves as a documentation of special training to which the research worker can refer in his or her application to the authorities.

At each stage of development of a given type of course dealing with radioactive materials certain requirements pertaining to the pensum in radiation protection have been recognised by the authorities as being desirable. Our original isotopes course was among those that essentially fulfilled the stipulated requirements.

4. THE INTERMEDIARY PERIOD 1973 - 75

In 1973 a voluntary system of course selection was introduced for most of the undergraduates at our University. Advantage was taken of this situation to open the isotopes course, not only to post-graduates, but also to undergraduates who had completed one year of basic studies. The philosophy being that an acquired knowledge on the use of isotopic tracers would support certain contemporary or subsequent undergraduate studies.

During the period 1973 - 75 it became apparent that conflicting interests were involved concerning the training in radiation protection. The undergraduates were not likely to be made personally responsible for the handling of radioactive material for years to come - if ever, whereas the post-graduates in most cases were on the verge of independent research in which they were planning to use one or more radiotracers.

In late 1975 the decision was taken to resolve the problem by establishing two courses instead of one, namely a basic course in isotope techniques and tracer methodology for undergraduates as well as post-graduates, and a supplementary course in health physics and isotope hygiene

for post-graduates.

The basic course comprises 74 hours of instruction in theory and practice, and only a small part of the time is allotted to training in radiation protection. No special diploma is issued.

5. THE NEW COURSE IN RADIATION PROTECTION

The supplementary course, which deals mainly with relevant aspects of radiation protection, comprises 48 hours of instruction evenly distributed between theory and practice.

Eligible for the course are post-graduates (and senior undergraduates) who have taken the basic course and passed the examination satisfactorily. Candidates from other colleges or universities are admissible on the same (or equivalent) conditions.

The main objective of the course in health physics and isotope hygiene is to provide previous participants in the basic course with a supplementary education, which the national radiation protection authorities deem to be appropriate for veterinary and agricultural research workers who, under personal responsibility, intend to apply radioactive material at the tracer level.

The subject matter of the supplementary course is taken from two international publications (4, 5), a number of laws, regulations and instructions printed by domestic authorities, and from other sources of relevant information. An outline of the present course curriculum is given below.

Lecture Matter

- Health physics units and their applications.

- Limits of exposure dose and isotope contamination.

- Health physics instruments, their function, calibration and use.

- Protection against external radiation.

- Protection against internal and external body contamination.

- Detection of radiation by thermoluminescence and by photographic emulsion.

- Planning of tracer experiments and procurement of isotopes.

- Treatment and disposal of radioactive waste.

- Laboratory features, accidents, medical checks, responsibilities.

- Legal restrictions, control measures, help and advice services.

Practicals

Absorption of beta-radiation.
Attenuation of gamma-radiation.
Dose control and use of gloved box, etc.
Decontamination and monitoring.
Analysis of isotope uptake by autoradiography.
The use of thermoluminescence.

Excursions

The National Institute for Radiation Hygiene.
Department of Health Physics, The Danish Atomic Energy Research Establishment.

All participants who complete the supplementary course and pass the examination (evaluated by the teacher and a health physicist) receive a certificate to that effect issued by the Royal Veterinary and Agricultural University.

REFERENCES

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- (3) IAEA Safety Series No. 1, "Safe Handling of Radioisotopes", International Atomic Energy Agency, Vienna (1962).
- (4) IAEA Safety Series No. 9, "Basic Safety Standards for Radiation Protection", International Atomic Energy Agency, Vienna (1967).
- (5) IAEA Safety Series No. 38, "Radiation Protection Procedures", International Atomic Energy Agency, Vienna (1973).