

Veterinary practices at abattoirs interesting to animal anatomy scholars

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Veterinary curriculum includes alimentary hygiene and meat inspection modules, which cover on-farm and in-transit animal health, restaurant hygiene, water quality, sewage treatment. Normally, it is tailored for Final year veterinary students. Some of these modules are complemented with placements within abattoirs. So practical experience in abattoirs is crucial in providing undergraduate veterinary students with the skills necessary to satisfy the Veterinary public health requirements, rotation is also done, normally.

Animal Anatomy is a basic course in undertaken during the pre-clinical years of the Veterinary curriculum, normally in the first year of study. Studying Animal Anatomy poses a challenge to new veterinary students due to the requirement to learn new nomenclature of various anatomical features of the animal. Typical subjects are myology, which is the study of muscular system, angiology, the study of blood vessels and osteology, the study of bones. Furthermore, an introductory lesson to neurology is also given.

Veterinary anatomy is a 'core medical curriculum' (Guimarães et al. 2017), and it encompasses theoretical and practical sessions (Mohamed 2020). Its teaching requires an array of teaching methods (Mohamed 2020). Traditionally, practical veterinary anatomy is taught via dissection and demonstrations of animal cadavers and viscerae (Mohamed 2020). As instructor of Animal Anatomy, we have taken advantage of abattoirs to strengthen hands-on competences in animal anatomy, not strictly on matters related to meat inspection. Are they really useful? It assumes that answer is yes, and here are some

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kinds of "justifications" for it. In no way we do pretend to debate between teaching models such as 'hands-on' activities on anatomical models or 'wet dissection' - or 'virtual activities' - (although in our opinion we must find an equilibrium between them, frequently more decided by costs than by educative efficacy).

Abattoirs represent not only suppliers of meat, but also of offal (non-edible products). It is very common to use fresh offal for anatomy practices (Timo Rieg 1997). The fact that they are fresh students able to perceive odor, texture and color - they may appear pale because most of them will have lost some blood-. And an important added value to this is that these viscerae are presumed to be free of zoonotic diseases, as a *postmortem* inspection ensures their lack of danger. Normally, national carcass disposal laws consider these viscerae differently from those of the animals which die at the farms, and ethically (and perhaps legally) their handling is totally different from those obtained from animals killed specifically for student practices, so abattoirs (and especially red meat abattoirs) must be a non-neglected source of teaching materials for veterinary students.

These extramural classes at abattoirs are critical components of veterinary education. In our opinion, interactions between abattoirs and students can create a rich educational environment that potentially stimulate and intellectually enhance learning outcomes for the students. It has been done with small groups of 8 to 10 students. However, teaching practical veterinary anatomy in abattoirs poses many challenges such as:

1. After stunning the animal, the lack of many neurological signs (due to the destruction of encephalon) allows to appreciate the expression of deficits for some cranial nerve function. For instance: ptosis of the upper eyelid (e.g. "lesion" of oculomotor cranial nerve), a pendulous tongue (e.g. "lesion" of hypoglossal cranial nerve), the

“dropped jaw” (e.g. “lesion” of trigeminal cranial nerve). It is very common to see incorrectly stunned animals. In this case, the “reflexive” point is reinforced. Due to risk associated with being closer to the hanged animals, this must be exclusively an observational part.

2. During skinning, superficial muscles are clearly visible: *latissimus dorsi*, *obliquus externus abdominis*, *trapezius* (with *fascia thoracolumbalis*), *pectoralis profundus*... Fore carcass structures are better identified than hind structures (*gluteobiceps*, *biceps femori*, *tensor fasciae latae*...) as animals are presented in ahang-up position.
3. The extraction of thyroid gland which is compulsory in Europe, as veterinarians must inspect them, allows close examination of larynx and its external muscles as well as thyroid gland. Lymphatic nodes are normally seen.
4. Extracted viscerae can be visually assessed *in situ*. It helps to learn anatomy that might be hard to see in books, like relative location of the kidneys and gastro-intestinal system, normally too gross to be evaluated “*in vivo*” in abdominal cavity. Many lymph nodes will be visible, also.
5. During maturation of carcasses, many internal muscles, frequently unobserved during dissection, are clearer: *diaphragm*, *intercostalisinterni*...
6. In butchery section, many muscular packs were seen. Butchers’ cuts differ greatly between countries, but it is always worthy to focus to categories, from highest (proximal hindlimb muscles) to lowest categories.
7. Before slaughter, chance to take a close look to live animals is very useful too: some information about breeds and how to animals’ discomfort could be evaluated at this point.
8. In the resting areas, some information on breeds can also be done as well as the possibility of detecting any disease that may have been missed before transporting the animal to the abattoir.

Students can have the opportunity to witness the animal slaughter and this provides an interesting step towards personal reflection on animal welfare. Many students are usually in a dilemma between their desire to help animals and some of

requirements of veterinary curriculum, so this offers a chance to compel students to reflect on the process (a practical advance to Deontology and Veterinary Law course). It must be that these abattoir practices are physically and emotionally demanding. Students gain “hardiness”, as abattoirs are environmentally hostile (cold, noisy, wet...) and frequently with strange timetables (very early in morning or during night). However, do not get confused with our reference to “hardiness”, it is not about “insensitivity” which may not be controlled for individual students!

It is to state that professional experience as abattoir inspector for more than 20 years has allowed me to gain a “normality” of view on this work, knowing “non described” aspects such as personal security, work with knives, addressing to workers. The knowledge of this “hidden world of slaughterhouses” where some of future graduates will end up, sometimes not as a deliberately pursue, is very interesting, too. Students can immerse themselves in new aspects of Veterinary curriculum and gradually progress into full clinical practice, without ever losing full contact with basic learning, exploring at the same time multiple roles of profession from beginning of their instruction.

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