

## TEACHING ANIMAL PRODUCTS IN NIGERIA: FROM MEAT SCIENCE TO TROPICAL ANIMAL PRODUCTS INDUSTRY

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### ABSTRACT

At the introduction of courses in animal products (AP) in Nigeria, meat science was the main focus of the training. In response to graduate unemployment and the paradigm shift to entrepreneurship, self-employment and job creation for university graduates the curriculum was expanded to include topics in economics and marketing and to emphasize the business dimension of AP. For the curriculum review to be successful there was the need to generate greater passion on the part of the teacher and the student to teach and learn, respectively, all the technical, as well as the business aspects of courses in AP. One well-tested way to generate student interest is to make textbooks available online in Open Access format that can be downloaded onto the smart phone. An Open Access e-book on the tropical animal products industry in Nigeria developed in compliance with instructional design directives evoked a higher student performance.

**Key words:** Teaching, Products, Course, e-book, Open-access

### INTRODUCTION

In the early 1970s and 1980s, the first lecturers in animal products in Nigeria were trained in meat science (mostly in the US); for example: Professors Okubanjo (UI), Igene (UniMaid and UniBen), Sonaiya (OAU) and Aduku (ABU). Typical textbooks used and recommended were: Judkins and Keener, 1961, *Milk Production and Processing*; Lawrie, 1966, *Meat Science*; Zottola, 1972, *Introduction to Meat Microbiology*; Kramlich, et.al., 1973, *Processed Meats*; Forrest et al., 1975, *Principles of Meat Science*; Mountney, 1976, *Poultry Products Technology*; Price and Schweigert, 1978, *The Science of Meat and Meat Products*; and Frazier and Westhoff, 1978, *Food Microbiology*. By the middle to late 1980s, efforts were made to produce original textbooks that would accommodate the peculiarities of handling animal products in Nigeria. Three such texts were: Sonaiya, 1984, *Animal Products*; Ikeme, 1990, *Meat Science and Technology – A comprehensive Approach*; and Aduku and Olukosi, 1991, *Animal Products - Processing & Handling in the Tropics*. It was clear that the curriculum needed to be expanded to include topics in economics and marketing of animal products. In the same period, Taylor and Kauffman (1983) reported that the challenges facing the teaching of animal science included increased need for computer integration, improved communication skills, integration of business and economics into the livestock management systems and the approaches that will motivate students to learn and think. In Nigeria, the value chain approach to AP opens up investment opportunities in the AP industry (Sonaiya, 1998).

A hypothesis of this paper is that making textbooks available online in an Open Access format with lots of illustrations and downloadable onto the smart phone will lead to improved student performance.

### MATERIALS AND METHODS

The response to changing needs for course content and student orientation must be accompanied by textbooks / instructional materials that are available online as electronic books in an Open Access format that makes access via the Internet as easy for the student as Facebook. To prepare adequate AP instructional materials requires the author to be familiar with curriculum and instructional design. In curriculum design, a course like Animal Products, as a segment of a B.Sc. / B. Agric. Animal Science (which can be visualized thus: Programme ← Courses ← Modules ← Study Units ← Sections ← Sub-Sections), must contain at least 3 modules. A module is a number of logically and thematically related study units. A study unit is the smallest segment of a course material that treats a topic which should adequately engage a learner for 3–4 hours of study. Each study unit can be viewed as an individual lecture and, depending on the topic, can be up to 25 pages (Times Roman, 13-point size, single spacing) or as brief as 7 pages. The content of a typical study unit (NOUN, 2012) is shown in Table 1.

**Table 1. Content of a typical study unit.****Study Unit Title:**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1
  - 3.2
    - 3.2.1
    - 3.2.2
    - 3.2.3
  - 3.3
  - 3.4
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Readings

**Table 2. Content of “Tropical Animal Products Industry in Nigeria”.****Module 1. Introduction to animal products, animal by-products and animal products industry**

## Units

1. Introduction to animal products and by-products
2. Introduction to the animal products industry
3. Products of captured, hunted and harvested free-living animals
4. Products of domesticated food animals
5. Products from other domesticated ruminants and herbivores
6. Products from insects and special animals
7. Animal fibres and inedible animal products

**Module 2. Meat production and primary processing**

8. Animal growth and development
9. Animal body composition
10. Primary processing systems
11. Slaughter and conversion of muscle to meat
12. Meat processing, preservation and storage

**Module 3. Secondary processing, product hygiene and safety**

13. Secondary processing of meat animal products
14. Processing of egg and milk
15. Animal products hygiene and inspection

**Module 4. Technical and economic aspects of animal products industry**

16. Distribution and sale of animals and animal products
17. Economic and social value of animal products
18. Animal products science & technology

The textbook author's role is to analyse the course description and break it into appropriate study units, write appropriate learning objectives for each unit, select relevant content to attain these objectives and design relevant questions / activities to assess learners' attainment of stated objectives. Course learning materials are to be self-instructional; i.e. to "replicate what the teacher does in the classroom". The materials must be interactive and must stimulate independent learning; should be self-explanatory, self-contained, self-directing, self-motivating and self-evaluating. Self-assessment exercises (SAE) use questions, exercises and activities to enable learners review what they have learnt and assess/evaluate themselves. Tutor-marked assignments (TMA) are needed at the end of every study unit and at the end of every module. These are short answer or essay questions, projects or practicals for students to carry out which can serve the purpose of continuous assessment (CA). Summative assessment (SA) is the end of semester examination. The content of "Tropical Animal Products Industry in Nigeria" (Sonaiya et. al. 2019), an Open Access e-book that was developed in line with instructional design directive, is shown in Table 2. The material was made available to the class via Google drive and class performance without (in the 2017/2018 session) and with the drive (in the 2018/2019 session) was recorded and charted.

**RESULT**

The class performance without and with The Tropical Animal Products Industry in Nigeria (TAPIN) drive is shown on Figures 1 and 2. With an enrolment of 43 students in Figure 1, 54% of the class scored less than 50% and only 2% scored 70% of the 50 marks obtainable. In Figure 2, enrolment was 51 and 0% of the class scored less than 50% while 23% scored 70% and above of the 72 marks obtainable.

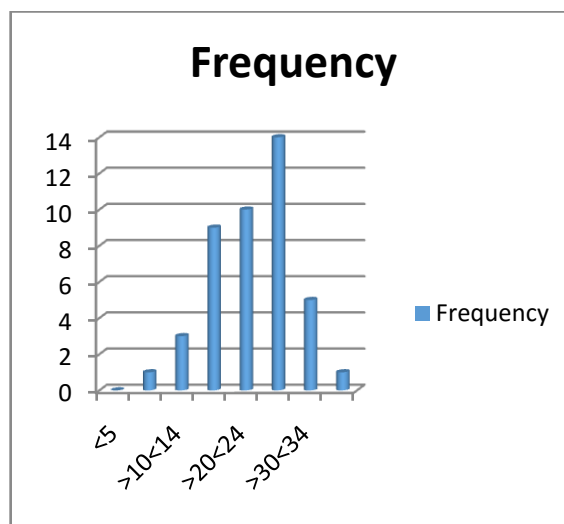


Figure 1. Class score without use of TAPIN

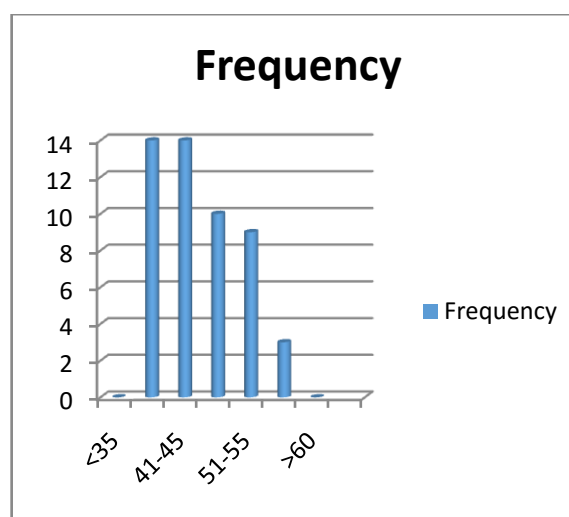


Figure 2. Class score with use of TAPIN

## DISCUSSION

Animal products – meat, egg and milk – have great potential for balanced human nutrition, physical and mental development in the tropical countries of the third world. The next generation of Nigerians needs animal production scientists that are well trained and knowledgeable about the science, business, economics and politics of animal products and can leverage their knowledge to create viable businesses in “Animal Agriculture [which is] the goldmine of Nigeria’s agro-revolution”.

## CONCLUSION AND RECOMMENDATION

In order to promote entrepreneurship in the AP industry, animal product scientists must apply the value chain approach in teaching about meat, milk and egg. To achieve this, Open Access e-books on the tropical animal products industry in Nigeria are needed. For the entire animal production science profession, a redesign of the curriculum is also recommended.

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