

Practical Exploration on Teaching Reform of Food Biochemistry Course for Tobacco Major

Wuxing Huang¹, Cong Ren², Huifang Shao³, Zicheng Xu⁴

¹ College of Tobacco Science, Henan Agricultural University, Zhengzhou, China

² Department of Basic Course, Henan University of Animal Husbandry and Economy, Zhengzhou, China

³ College of Tobacco Science, Henan Agricultural University, Zhengzhou, China

⁴ College of Tobacco Science, Henan Agricultural University, Zhengzhou, China

⁴Corresponding author

E-mail: ¹hwxwhu@gmail.com, ²40877341@qq.com, ³shf.email@163.com, ⁴zichengxu@163.com

Abstract

Tobacco major is specially designed by the country for its distinct industry and characteristics. *Food Biochemistry* is one of the basic courses of tobacco major. Under current conditions lacking of teaching materials with specialty characteristics, in order to enhance the pertinence, based on the current teaching material, *Food Biochemistry*, the ecological research group on tobacco quality from Henan Agricultural University conducts series of reforms about teaching contents, teaching methods and evaluation methods. These reform measures have fully mobilized students' initiatives for studies, improved teaching quality and are expected to provide certain references for teaching of this course by colleges and universities in the same industry.

Keywords: tobacco, food biochemistry, teaching reform, practical exploration.

1. Introduction

Tobacco major with its distinct industry characteristics, specially designed by the country under agronomy category (specialty code: 090108T), mainly aims at cultivating application-oriented and versatile advanced specialized talents that have solid biology and economics foundations, possess basic theories, knowledge and skills about tobacco production and operation management, etc., and can work on tobacco production, teaching and research, technological development, operation management of tobacco enterprises, trade of tobacco products, etc. in the tobacco and relevant departments or units. For now, colleges and universities in the main tobacco production areas like Henan, Yunnan, Guizhou, Hunan, Sichuan, and Shandong, etc. all have tobacco majors.

Food biochemistry is the sub-discipline of biochemistry, and also is an important basic course about the application of basic biochemistry theories on food processing and preservation technology. Application of basic theories of this science on industries like food and fermentation, etc. runs through the formulation and development of this discipline. For now, lots of colleges and universities in our country have offered *Food Biochemistry* course as the specialized course or specialized basic course for food and relevant majors. Tobacco as a special kind of addiction commodity, its curing and baking of tobacco leaves, storage and preservation of strips, design of blending adaptability and evaluation of sensory quality all have close relations with food biochemistry. As a result, *Food Biochemistry* becomes one of the basic courses for tobacco processing major. However, teaching materials with specialty characteristics

like *Tobacco Biochemistry*, etc. have not been published till now. In order to satisfy the cultivation of high-leveled tobacco talents, the ecological research group on tobacco quality from Henan Agricultural University conducted comprehensive reforms about the teaching of *Food Biochemistry* course, and gradually formed a scientific, reasonable and characterized curriculum system. Now the practical exploration on reforms is summarized as follows.

2. Reasonable Arrangements of Teaching Contents

As teaching materials with specialty characteristics like *Tobacco Biochemistry*, etc. have not been published till now, we choose *Food Biochemistry (China Light Industry Press)*^[1], which is written by Wang Miao and Lv Xiaoling, as the referenced textbook for teaching. This textbook centering on food and consumers of food—people, fully and systematically introduces the basic theories and knowledge of biochemistry, and the biochemical changes of carbohydrate, lipid, protein and vitamin, etc. in food during the food processing, and the influences on food quality. With the complete knowledge system, multiple knowledge points, and complex levels, this textbook is called the classical teaching material for introduction. However, the textbook is lack of pertinence for tobacco major. Thus, the teaching contents must be arranged reasonably, and the teaching system of *Food Biochemistry* must be optimized. Combined with the practical situations of specialty characteristics, placement of graduates, and scientific research of the teachers, based on multiple panel discussions with teachers of specialized course, we write the syllabus of *Food Biochemistry* course for tobacco major.

We delete the contents in Chapter 14 about relations of material metabolism and summarization of metabolic regulation, and Chapter 15 about transmission of genetic information from the textbook and give no elaborations. We combine the contents in Chapter 2 about water and minerals in food, Chapter 3 about chemistry of carbohydrate, Chapter 4 about chemistry of lipid, Chapter 5 about chemistry of protein, Chapter 6 about nucleic acid chemistry and Chapter 7 about functional organic micro-molecule into the module of “Basis of Food Chemistry”. We combine the contents in Chapter 8 about enzyme, Chapter 9 about biological oxidation, Chapter 10 about glucose metabolism, Chapter 11 about lipid metabolism, Chapter 12 about degradation of protein and metabolism of amino acid, and Chapter 13 about degradation of nucleic acid and metabolism of nucleotide into the module of “Basis of Biochemistry”. Meantime, we increase the teaching contents about physiological and biochemical cultivation, biochemical bake, biochemical storage, biochemical blending and evaluation of sensory quality, etc. as the module of “Biochemical Application of Tobacco” so as to emphasize the characteristics of tobacco major. The teachings of “Basis of Food Chemistry” and “Basis of Biochemistry” modules shall clarify conceptions, rationalize contexts, elaborate rules and emphasize key points and difficult points. The teaching of “Biochemical Application of Tobacco” module shall link with practice, emphasize tobacco, and arouse students’ interests.

3. Adoption of Diversified Teaching Methods

On one hand, the application of modern educational technology can enhance students’ interests in learning. The adoption of multimedia teaching measures can increase the amount of information^[2, 3] effectively. For example, the combination of pictures with abundant growing tobaccos can assist students to understand relevant abstract theories better. While sometimes multimedia teaching measures also have shortcomings like students’ passive learning, lacking of thinking and interactivities, etc. At this point, the combination of multimedia teaching measures with teaching methods like question-inquiry teaching,

study-discussion pattern, and practical teaching, etc. [4] can mobilize students' initiatives to study, develop students' innovation consciousness and innovation ability, and finally realize the "three interactions", that is, interaction between teachers and students, interaction in class and after class, and interaction of theory and practice.

On the other hand, the invitation of experts into class can expand students' horizon. During the teaching, invite experts of specific domains in chapters to teach contents in relevant domain and introduce the latest developments in this domain as much as possible, by which the teaching contents are expanded and students' enthusiasm for active learning are mobilized. For recent years, we have taken opportunities for many times like experts' coming to Zhengzhou for meetings from different domains of food biochemistry, and participation in postgraduate' defense of dissertation so as to invite experts to class, which have been widely welcomed by students.

4. Improvement of Evaluation Methods

In order to improve students' comprehensive qualities, we altered the forms before that determining result only by scores of written examinations, and adopt the combination of academic thesis, interactive discussion in class and final examination to evaluate students' learning comprehensively.

As for academic thesis, it requires student to select a topic from progresses and expectations of theoretical teaching, refine his own thought by consulting relevant data, and write according to the form of Food and Biotechnology Academic Journal in the latest edition, and requires teacher to comment intensively on common problems in academic thesis. In this way, students can not only know about and grasp relevant specialized knowledge, enhance their initiatives for study, but also practice their self study abilities and writing abilities.

During the interactive discussion in class, students are required to self-study specific teaching contents, prepare multimedia courseware, and then give a lecture on the platform. The rest of students are required to discuss, and at last, teacher will give instructions according to students' lecture and discussion. This method that students give a lecture and the rest of students participate in discussion mobilizes students' initiatives, deepens the understanding of the same knowledge point from different angles, and also practices students' abilities to analyze, summarize and express.

As for the final examination, select relevant question types for different teaching contents. For example, classical contents in the modules of "Basis of Food Chemistry" and "Basis of Biochemistry" shall adopt explanation of nouns, confusing conceptions shall adopt true or false questions and progressive contents shall adopt short answer questions. While application contents in the module of "Biochemical Application of Tobacco" shall adopt essay questions. This method can not only evaluate students' knowledge about basic conceptions, theories and technologies, but also assess students' application ability to these theories and technologies.

5. Conclusions

According to results of feedbacks of teaching evaluation in recent 3 years, we can see that reforms of teaching contents, teaching methods and evaluation methods about *Food Biochemistry* for tobacco major can not only make students grasp relevant knowledge about food biochemistry more solidly and pertinently, but also can enhance students' writing abilities and language expression ability. Meanwhile, more and more students are getting interested in tobacco biochemistry, and apply for postgraduate. Each year students of other majors also take this course as an elective. In conclusion, the above reforms make

the teaching of Food Biochemistry course adapt to the needs of tobacco major indeed.

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