出國類別：參加學術研討會

參加泰國曼谷第十五屆亞太畜產學大會(THE 15th AAAP ANIMAL SCIENCE CONGRESS)報告書

服務機關：國立中興大學動物科學系

姓名：范揚廣

職稱：教授

派赴國家：泰國曼谷

出國期間：**101** 年 **11** 月 **25** 日至 **12** 月 **2** 日

報告日期：**101** 年 **12** 月 **20** 日

摘 要：

於101年11月25日至12月2日前往泰國曼谷市參加第十五屆亞太畜產學大會(THE 15th AAAP ANIMAL SCIENCE CONGRESS)學術研討會，，於會中發表水禽於遺傳與育種(品系對鵝飛機翼之影響及光照對生長性狀之影響)、毒理(T-2毒素及壬基酚)和胚胎發育之6篇海報，以及降低反芻動物甲烷生成量為主題之2篇海報及1場口頭發表。

此次大會有19個國家代表與會，各與會國畜產相關之產、官、學界人員，其中以教授、研究生為主，另有技術人員、產業團體等，進行相互討論及經驗分享研究成果。會中口頭發表論文344篇，海報展示發表541篇，總共885篇論文。藉由會後參觀活動，包括: 參訪泰國養牛產業、小型有機牛奶牧場以及養鴨場與其屠宰場，會議與參訪內容可供國內畜禽產業提升畜牧生產效率與品質之參考。

目　　次

壹、目　的

本次赴泰參加第十五屆亞太畜產學大會(THE 15th AAAP ANIMAL SCIENCE CONGRESS)學術研討會之目的為增加碩、博士研究生參加國際學術會議之經驗，藉機與各國研究人員等討論飼料對動物營養、遺傳及育種等議題，並藉由會後參觀活動，瞭解泰國地區之畜牧現況，供作國內研究畜禽遺傳及提升畜牧生產效率與品質，促進產業競爭力等相關研究之靈感來源。

貳、過　程

一、行 程 表

11 月 25 日 (星期日)	上午	自臺中啟程
11 月 25 日 (星期日)	下午	搭乘華航航空至泰國曼谷市(BANGKOK CITY)
11 月 26 日 (星期一)	08:00	第十五屆亞太畜產學大會(THE 15th AAAP ANIMAL SCIENCE CONGRESS)報到
	09:00～10:30	開幕(Opening ceremony)
	10:30～12:30	大會專題報告
	13:30～17:30	分組討論
	18:00～	歡迎晚會(Welcome party)
11 月 27 日 (星期二)	09:00～10:30	專題演講
	11:00～12:00	分組研討會及海報展示
	13:30～17:30	分組討論會及海報展示
11 月 28 日 (星期三)	07:00～17:00	泰國畜牧產業參訪
11 月 29 日 (星期四)	09:00～10:30	專題演講
	11:00～12:00	分組研討會及海報展示
	13:30～17:30	分組討論會及海報展示
	18:00～21:00	結束晚會(Final dinner)
11 月 30 日 (星期五)	07:00～17:30	參訪泰國現代化養鴨場
12 月 01 日 (星期六)	07:00～17:30	泰國畜牧產業參訪
12 月 02 日 (星期日)	07:00～24:00	由曼谷市 搭乘中華航空至桃園中正機場 返回臺中

二、內容重點

1.會議地點:

第十五屆亞太畜產學大會(THE 15th AAAP ANIMAL SCIENCE CONGRESS)學術研討會於泰國曼谷市(BANGKOK CITY) Thammasarrt Univesity 的 Learning Center Building 4 (LC4) 會議中心舉行。曼谷市為泰國首都，面積為 1568.7 平方公里，曼谷地處平原，屬於湄南河流域。曼谷市內繁忙的水上交通使曼谷有「東方威尼斯」的美稱。曼谷為熱帶氣候。

2.會議內容:

Ⅰ.論文發表

第十五屆亞太畜產學大會(THE 15th AAAP ANIMAL SCIENCE CONGRESS)學術研討會於11月26日早上9時開幕，由大會主席Dr. Chayanon Kitayachaweng主持。共來自世界19個國家代表，包含各國產官學界相關人員、教授、研究人員、技術人員、產業團體等，進行相互討論及經驗分享研究成果。中興大學動物科學系師生組團前往發表，研討會內容豐富，大會專題報告題目有Dr. FALVEY對動物與人類飢餓關係，Dr. Chantalakhana對In Situ方法保存動物基因等講座。此次大會有畜產各領域之專題演講，發表論文以口頭報告者344篇，海報展示者541篇，總共885篇論文，分屬於下列七項主題:

(1)營養與飼料技術(NUTRIENT AND FEED TECHNOLGY)。

(2)育種與遺傳(BREEDING AND GENETICS)。

(3)生理與健康照護(PHYSIOLOGY AND HEALTH CARE)。

(4)其他(OTHER)。

(5)食品科學與技術(FOOD SCIENCE AND TECHNOLOGY)。

(6)管理、福祉與環境關係(MANAGEMENT, WELFARE AND ENVIRONMENTAL CONCERN)。

(7)教學與推廣(EDUCATION AND EXTENSIONS)。

報告人與實驗室成員在本次會議共發表9篇研究報告，其題目列於下。

1. Effects of light intensity on growth and egg production in white roman goose.
2. Effect of nonylphenol on semen quality and testosterone level in male breeders of Brown Tsaiya.

3. Effect of forage sources on methane emissions in growing female crosses of dairy goats.
4. Effects of lines genetically selected for heavy body weight or angel wing and nutrient density on incidence of angel wing in white roman goose.
5. Study of early embryonic development of Brown Tsaiya duck by filter paper carrier method.
6. Effect of dietary supplementation of water caltrop hull on methane emissions in growing female crosses of dairy goats.
7. Ligninolytic enzymes produced from pleurotus citrinopileatus cultivation residue as the enhancer of fiber Degradation in Ruminants.
8. Influence of Dietary Nonylphenol and Selenium Contents on selenium metabolism in male Brown Tsaiya duck.
9. Influence of dietary T-2 Toxin on growth and egg production performances in Brown Tsaiya duck.

由於資料齊備內容充實，深獲與會專家重視及討論。

Ⅱ.參訪活動

11月28日參訪泰國乳牛產業

(Ⅰ) Dairy farm promotion organization of Thailand, D.O.P

泰國乳牛產業為泰國重要農業產業之一，剛成立時，泰國國王親身蒞臨巡視，可見泰國對此產業之重視，D.O.P單位成立於1962年(民國51年)，負責泰國產業與學界之研究及產業示範，該場提供泰國相當大部分之乳製品，其養牛部門負責提供生乳，其乳品廠負責乳品加工。其他乳廠則以收集各民間乳牛場之生乳，泰國目前乳牛場多屬於小農方式經營，集乳業者會到各小型牧場收集生乳，小農場之生乳則以不銹鋼乳桶盛裝，再交給集乳車，因此不易控制生乳品質，又泰國位於熱帶地區，常年高氣溫，小牧場沒有低溫保存生乳設備，靠集乳桶運送生乳，在運送過程極易產生變質。Thail-Danish乳品為泰國最大乳製品場，該場由政府投資負責生產學童乳，運送至泰國各學校，其他產品的種類，包括鮮奶、保久奶、優格及優酪乳等乳製品，配送至各市場及超市，此次參觀其過程，包括至該公司之乳品加工廠，從集乳車進場利用真空將乳吸至集乳槽，低溫保存及殺菌過程，後端之成品包裝等，可充分了解泰國乳業發展過程及其指標企業。

(Ⅱ)小型有機乳牛場

泰國發展小規模、有機方式生產牛奶，以區域性為單位，集合附近小規模牛場，將各酪農戶生乳由有機牛奶公司收集。以一有機牛乳生產農場Lumbong Farm為例，該單位由附近酪農戶提供生乳，每個酪農場需經政府認證，取得有機牧場證書，有機牛乳生產工廠再至各牧場收集特殊化產品。以Lumbong Farm為例，每家有機牧場約養35-40頭牛，每場每日約生產70公斤生乳，以泰國生乳每公斤價格為22泰銖換算，每月粗收入有46,200泰銖，每月支出於電力及飼料費用為14,965泰銖，每月粗估毛利為31,235泰銖。這對酪農家庭而言，此種小規模經營有其重要，為其家戶收入。生乳經乳品公司收集後，製作成各式小包裝之產品，包括冰淇淋、特殊化鮮奶、優格及優酪乳等，成為泰國當地特色化乳製品。若輔導臺灣較小規模酪農作有機牛乳生產場，或許是臺灣酪農經營的另一種選擇。

11月30日參訪泰國養鴨產業

(Ⅰ)參觀現代化養鴨場

由大陸華僑移民至泰國已經第三代的陳氏集團養鴨場，該農場位於曼谷南方約1小時車程，共有三個養鴨場，其規模分別為13、15及20萬隻之在養隻數(圖七)，每年肉鴨產量有320萬隻，主要提供曼谷超級市場及各餐廳使用，為知名鴨肉提供來源，該集團並飼養約2,500隻母豬及50,000頭肉豬，該集團另有自家飼料廠及鴨隻屠宰場。泰國甚受禽流感侵襲，戶外養鴨已不可行，所以均採水簾式飼養方式，加上禽舍具備防鳥網，可有效杜絕禽流感。

參訪中，鴨場負責人陳董事長表示，養鴨產業非常辛苦，隨時要掌握鴨隻狀況，做出最佳管理作為，調整設備使鴨子生長更加快速，以該廠生產北京鴨及番鴨為例，北京鴨生產天數約38天即可上市。鴨舍採負壓式水簾，飼料及飲水採自動化，飲水以水盤供應，可刺激鴨子玩水，增加其採食量，以縮短飼養期間，該公司自我期許，達成每M^2面積可生產35-40公斤肉鴨。

(Ⅱ)鴨隻屠宰場

陳氏集團之鴨屠宰場每日屠宰鴨隻數量為9,000-10,000隻。參觀其屠宰場發現，該工廠負責人從各國吸收技術，作為屠宰場改善經營之依據，鴨隻經運輸車運送至屠宰場，以自動電昏設備將鴨隻電昏、放血，放血後之血液以容器收集，為保持鴨血成品之彈性加入一定比例之水，經加熱殺菌以確保鴨血之新鮮度再出售。鴨隻以自動脫毛機脫毛，再以食用膠脫去羽根，鴨隻內臟用真空機吸除屠體內部之肺及腎臟等，屠後鴨隻再以人工去除殘餘細羽(頭、翅下及尾部)，以確保屠體品質，這部分為屠宰鴨隻最費人工的地方，該公司認為去除細羽部分最花人工，其他流程皆可以自動化機械取代，屠體以4℃冰水降低其溫度，之後，依體重分類成各種產品規格，真空包裝後出售，或者屠體分切成部位後出售。

屠宰後鴨羽毛立即進行清洗、風乾，鴨羽由脫毛後至粗洗、風乾於一小時內完成，所得粗毛成品無不良味道。臺灣鴨隻屠宰後羽毛於12小時內送至粗洗場洗潔，屠宰場與粗洗場各自分工，因此，雖尚不致有羽毛發臭現象，總不如泰國鴨隻屠宰場之作業效率，這部分值得借鏡。臺灣羽毛加工業享譽國際，羽毛進口量每年約14,000頓，羽源主要來自大陸、東南亞及歐美各地，如何將此加工業更加提升，及國產羽毛質、量供應之提升，可能為國內產、官、學、研各界值得關注領域之一。

該集團的各項產品不僅供應泰國境內需求，也出口鴨肉至新加坡及歐洲等地，且其產品多元化，尤其各生產鏈相互間整合提升效率，值得臺灣水禽生產場學習範例之一。

參、心　得

(一)亞、澳各國有已開發國家及開發中國家，可互相借鏡，藉由動物品種改良技術，改善各國動物品種之選留技術。

(二)品種選育制度、選育理論基礎及統計運用，作為選拔地區性品種或生產特有品種，應長期投入研究。

(三)水禽產業發展日新月異，技術上突飛猛進，吸收國外經驗及深思國內產業現狀，提升國際競爭力。

(四)泰國小規模有機鮮乳生產模式，是否可引進臺灣，增加乳品豐富度，可深入進行研究。

(五)韓國與大陸之畜產學術研究水準原在臺灣之下，本次與會已見其學術研究水準或追平或超越。臺灣若不寬列經費加強學術研究，已漸失競爭力。

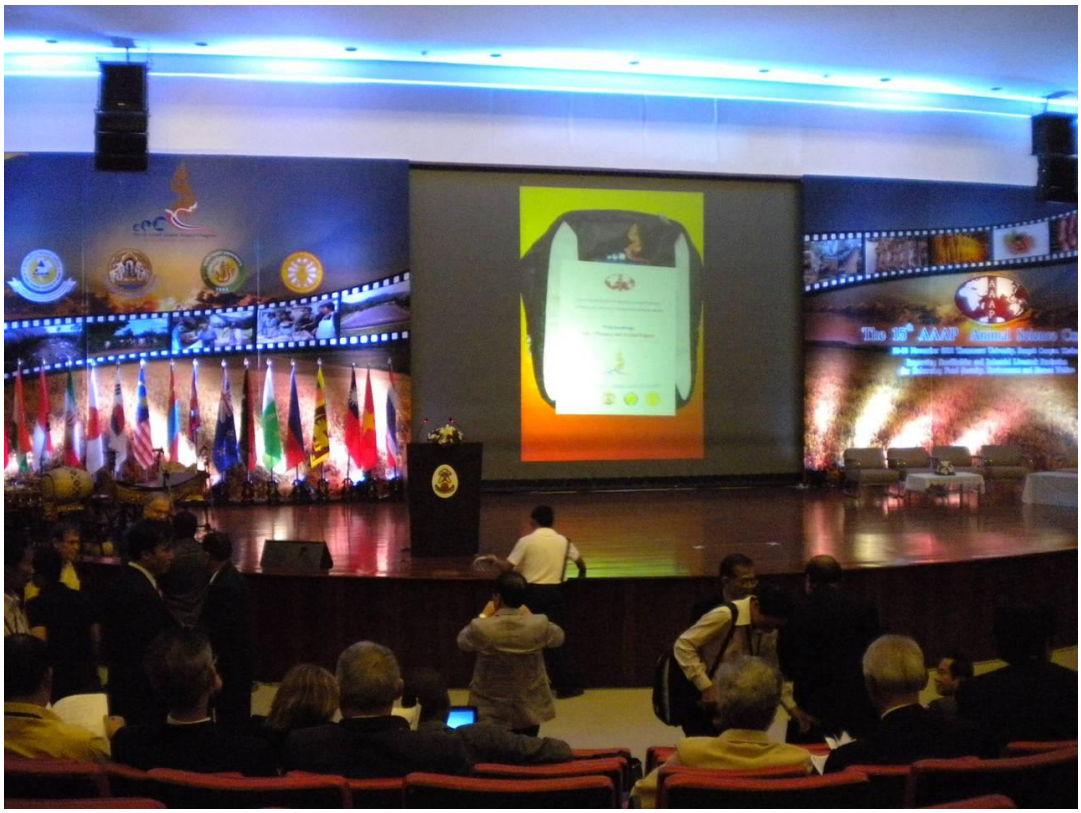
肆、建　議

(一)各國與會人士年齡層以青壯年學者為主，而臺灣卻以中老年學者為中堅，此種年齡斷層更使人憂心。宜有專案鼓勵與支持年輕學者作學術研究並積極參與國際學術會議，增加研究人員國際觀，並帶動國內產業競爭軟實力。

(二)臺灣面積狹小，產業規模及資源較為受限，無法與泰國或大陸等地競爭，發展少量多元化精緻產業，提高產業競爭力。

(三)本校應支持動物科學系努力爭取主辦相關國際學術活動，使本校在國際上突顯學術地位。

伍、圖　片



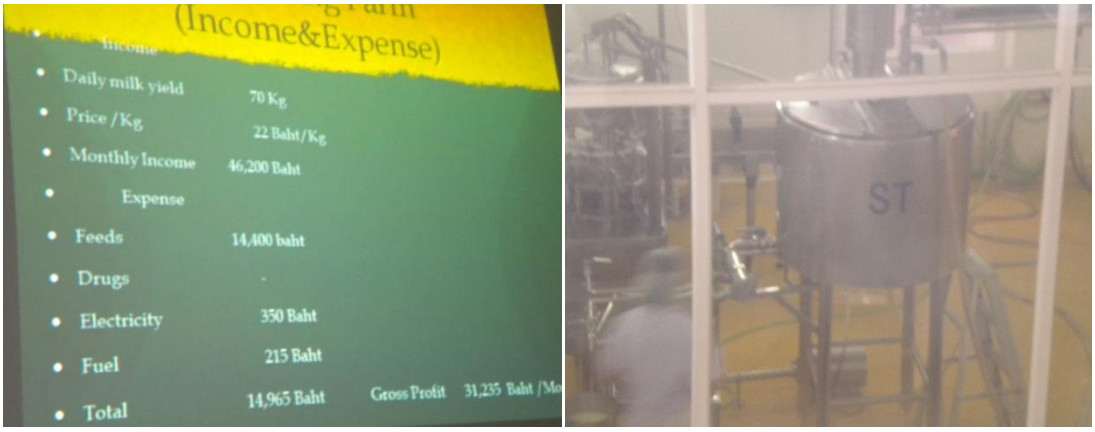
圖一、第十五屆亞太畜產學大會(THE 15th AAAP ANIMAL SCIENCE CONGRESS)。

圖二、中興大學動物科技系師生組團參加第十五屆AAAP大會。


圖三、實驗室成員進行論文發表時與其進行合影。

圖四、泰國D.O.P之介紹投影片及該農場牛隻放牧於草原情形。


圖五、D.O.P乳品產品之展示及說明過程。



圖六、有機牛場生產成本分析之介紹投影片及產品加工過程。


圖七、陳氏養鴨場飼養北京鴨之情形。


圖八、陳氏養鴨場屠宰場員工進行拔羽及屠體分裝之情形。

陸、附　件(論文報告內容)

EFFECTS OF LIGHT INTENSITY ON GROWTH AND EGG PRODUCTION IN WHITE ROMAN GOOSE

Shen-Chang Chang[1,2], Min-Jung Lin[1,2], Yu-Shine Jea[2] and Yang-Kwang Fan[1]

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This study was to investigate the effects of lighting intensity on the body weight gain and egg production performance in White Roman goose kept in an environmentally controlled house. According to a completely randomized design, one hundred and eighty-six geese were randomly assigned into 10 rooms in the house, which were randomly allotted into two treatments of lighting intensities, i.e., 300 and 40 lux. The age at first lay of the geese was 10 months on average. The results showed that the geese under 300 lux in comparison with those under 40 lux were not significantly improved in body weight gain across the laying stage. The geese under 300 lux light intensity comparing to those under 40 lux yielded more eggs (62.6 *vs.* 45.3 eggs/bird, P = 0.0002). In conclusion, high light intensity results in more eggs produced per goose without changes of body weight and laying duration during egg production season.

Key Words: light intensity, egg production, White Roman goose

EFFECTS OF LINES GENETICALLY SELECTED FOR HEAVY BODY WEIGHT OR ANGEL WING AND NUTRIENT DENSITY ON INCIDENCE OF ANGEL WING IN WHITE ROMAN GOOSE

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ABSTRACT

This study was to investigate the effects of three lines of White Roman geese, i.e., two lines genetically selected for either rapid growth (heavy body weight, HBW) or angel wing (AW) plus a commercial line (CL), and nutrient densities (ND) on the incidence of angel wing (IAW) and marketing body weight. According to a completely randomized design, one hundred and ninety-two geese were randomly assigned by sex (50% male: 50% female) into 12 pens, which were randomly assigned to six factorial treatments (3 lines × 2 ND). The results showed that HBW comparing to AW and CL had heavier body weight at 12 week-old (5.70 vs. 5.30 and 5.20 kg, $P < 0.0001$). AW comparing to HBW and CL had greater (IAW) at 12 week-old (1.71 *vs.* 0.21 and 0.43, $P < 0.0001$). The birds fed low ND comparing to those fed high ND had a tend to lower IAW at 14 week-old (4.6% vs. 18.5%, $P < 0.10$) and lighter body weight by 8 week-old. The effects of interactions between lines and ND on IAW and body weight were not observed. In conclusion, the birds in angel wing line had higher accidence of angel wing than the other two lines, and those birds with low nutrition concentration diet had a trend to lower and accidence of angel wing than those with high nutrition concentration diet.

Key Words: White Roman geese, angel wing, body weight

Effect of nonylphenol on semen quality and testosterone level in male breeders of Brown Tsaiya

M. C. Cheng[(1)(2)] , C. M. Hung[(1)], T. Y. Kuo[(1)], Y. H. Chen[(1)], M. Y. Tsai[(1)], M. C. Chan [(1)], M. P. Cheng[(1)], and Y. K. Fan[(2)]

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ABSTRACT

Nonylphenol (NP), an estrogen like compound classified as an endocrine disrupter capably interfering hormonal system of numerous organisms, originates principally from the degradation of nonylphenol ethoxylates (NE) widely used in industrial, agricultural, commercial and household applications as detergents, emulsifiers, wetting and dispersing agents. Due to the extensive use of NE, NP may reach either sewage treatment fields or rivers and contaminate environments from many aspects. Water fowls mostly raised with water pools in which the water coming from either underground or rivers may be contaminated with NP and were consequently affected of their reproductive performances. Thus, the study was to investigate the effect of NP on reproductive performances in male breeders of Brown Tsaiya (MBBT) in Taiwan. Sixty MBBT at age of 50 wks were randomly assigned into five treatments, i.e., control, corn oil, and oral administration of either 1 (NP1), 10 (NP10) and 250 (NP250) mg NP dissolved in corn oil/kg body weight daily for 28 days. Semen was collected weekly for analyses of counts, viability, acrosome integrity, mitopotential integrity, total cytosolic calcium content and DNA condensation (sperm chromatin structure assay, SCSA) of sperms, and testosterone level. Fertility was determined with intermingled semen collected from each bird in the same treatment for artificial insemination. Results revealed that there were no significant differences among the treatments in counts, viability, acrosome integrity, mitopotential integrity and total cytosolic calcium content of the sperms as well as fertility. SCSA in NP10 or NP250 was, however, significantly higher than that in the other treatments ($P < 0.05$). Testosterone level in NP1 was significantly lower than that in the other treatments ($P < 0.05$). In conclusion, nonylphenol may affect semen quality and testosterone level in male breeders of Brown Tsaiya and consequently reduced their reproductive performance if the duration and/or the dosage of exposure are over the threshold which has not been fully and clearly elucidated so far.

Key Words: Nonylphenol, duck, reproduction performances

Effect of forage sources on methane emissions in growing female crosses of dairy goats

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ABSTRACT

Emission of methane is a major concern for ruminant production because of the consequences to climate change. Improved animal productivity and dietary manipulation are two strategies that have shown potential for reducing methane emissions. Factors such as the forage species, quality of forage and processing may influence CH_4 production in the rumen. The purpose of this study was to determine different forage sources on methane production in goat. Four goats were contemporarily, repeatedly and randomly assigned into one of four dietary forage treatments which were comprised either (1) corn silage or CS, (2) bermuda hay or BH, (3) 2/3 corn silage and 1/3 alfalfa hay or CSAH, or (4) 2/3 bermuda hay and 1/3 alfalfa hay or BHAH along with 50% concentrate on DM basis. Methane emissions measured with respiratory chamber were 9.41, 12.3, 9.82 and 9.28 g/kg of DM intake in goat fed with CS, BH, CSAH and BHAH, respectively. In conclusion, methane emissions in goats fed with grasses may be decreased by feeding the forages combining with legume such as alfalfa hay.

Key Words: Methane, Forage, Goat

Study of early embryonic development of Brown Tsaiya duck by filter paper carrier method

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ABSTRACT

Currently, the poultry embryo is often used as a model to understand morphogenesis studies due to its availability, accessibility, and relatively low cost. But the morphological features associated with duck embryo development are not well established. The purpose of this study was to establish the early stages of normal embryonic development in duck by using filter paper carrier method. The method was using a piece of filter paper, with a central hole as a frame to hold the blastoderm and vitelline membranes under tension. A major benefit of the method was that it was suitable to study early embryonic development quickly and efficiently. The developing stages of duck embryo consisted of cleavage phase, zona pellucida formation, hypoblast formation, primitive streak phase, somite phase, and organogenesis phase. Chronological stages of early embryonic development in Brown Tsaiya duck was described with photos in this study.

Key Words: Embryonic development, Brown Tsaiya duck

Effect of dietary supplementation of water caltrop hull on methane emissions in growing female crosses of dairy goats

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ABSTRACT

Methane is produced as a by-product of the digestive process and represents a loss of feed energy (2–12%) from the diet. It also is one of the primary greenhouse gasses emitted from production of ruminants. Several studies have indicated that tannins, which are rich in parts of many plants, can reduce the methane emission by goats. The purpose of this study was to determine effect of dietary supplementation of water caltrop hull (WCH), which is rich in content of tannins and plentiful production in Taiwan, on methane emissions in goat. Four goats were contemporarily, repeatedly and randomly assigned into one of four dietary treatments comprised either (1) bermuda hay or BH, (2) corn silage or CS, (3) 4/5 bermuda hay plus 1/5 air dried WCH (containing 0.32g/kg tannins) or BHWCH, or (4) 4/5 corn silage plus 1/5 air dried WCH or CSWCH along with 50% concentrate on dry matter basis. Methane emissions measured with respiratory chamber were 12.0, 9.41, 9.97 and 9.19 g/kg of dry matter intake in goats fed with BH, CS, BHWCH and CSWCH, respectively. In conclusion, corn silage rather than bermuda hay plus air dried water caltrop hull might decrease methane emissions in goats.

Key Words: Methane, Water Caltrop Hulls, Goat

Ligninolytic enzymes produced from *Pleurotus citrinopileatus* cultivation residue as the enhancer of fiber degradation in ruminants

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Abstract

Lignin is the major component that plays an important role in restricting ruminal degradation of structural polysaccharides such as cellulose and hemicelluloses. Mushroom cultivation residue (MCR) contains high proportion of lignin that no enzyme from domestic animals per se can digest them. Delignification of MCR by ligninolytic enzymes, which include of laccase, manganese peroxidase and lignin peroxidase, has the potential to improve its value as ruminant feedstuff. To optimize the ligninolytic enzyme production from golden oyster mushroom (*Pleurotus citrinopileatus*) during fermentation of its MCR along with improving its cell wall contents and chemical composition were assigned. The MCR is prepared for forming two formulas silage with 2% urea dissolved in 18% and 8% molasses (MCRS1and MCRS2, respectively) on dry matter (DM) basis, exclude of control (100% MCR). The fermentation period was 0, 150 and 360 days. The activities of manganese peroxidase and lignin peroxidase are highly significant ($P < 0.001$) produced in MCRS1 (1,095 and 12,061 U/mL, respectively) and MCRS2 (955 and 14,055 U/mL, respectively) during 150 days of the fermentation period. Cell wall contents such as neutral detergent fiber, acid detergent fiber and acid detergent lignin were significantly ($P < 0.001$) improved by losing their contents along the fermentation period for all treatments. Result revealed that *Pleurotus citrinopileatus* cultivation residue silage could be produced the ligninolytic enzymes, which able to improve its fiber contents and could be use as the ruminants feedstuff.

Key words: *Pleurotus citrinopileatus*, mushroom cultivation residue, silage, ligninolytic enzymes

Influence of Dietary Nonylphenol and Selenium Contents on Selenium Metabolism in Male Brown Tsaiya Duck

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ABSTRACT

Nonylphenol (NP), an environmental estrogenic chemical, is believed to be able exerting adverse effects on reproductive organs of animals. Selenium is known to play important roles in reproductive functions and development as well as immunocompetence. According to a completely randomized design, 18 male Brown Tsaiya ducks were randomly assigned into a factorial treatment arrangement, i.e. 3 (0, 10 or 100 NP mg/kg body weight) × 2 (with or without 0.4 Selenium mg/kg diet) for 7 days. The birds were caged individually and given feed and water freely. The results showed that feed conversion ratio was significantly decreased in 100 NP without Se ($P<0.05$). Se concentrations in kidney was increased by either 10 NP or 100 NP regardless combining either with or without Se. Se content in heart or breast was lower in either 10 NP or 100 NP along with Se than that without Se. The Se concentration in gizzard was increased by dietary supplementation of Se or by the interaction between NP intake and dietary addition of Se. Moreover, Se content of testes was significant lower by dietary addition of NP and Se and the interaction between NP intake and dietary addition of Se. In conclusion, the distribution of Se among organs in duck may be influenced by NP, of which the toxicological meanings require further elucidation.

Key words: Nonylphenol, Selenium, Brown Tsaiya duck

Influence of Dietary T-2 Toxin on Growth and Egg Production Performances in Brown Tsaiya Duck

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ABSTRACT

T-2 toxin (T-2) occurs occasionally in agricultural products and is possibly involved in severe toxicoses in human and farm animals. According to a completely randomized design, 120 newly hatched Brown Tsaiya ducklings were randomly assigned into a factorial treatment arrangement, i.e., 3 (0, 0.5 or 5 T-2 mg/kg diet) × 2 (pure T-2 or gross T-2) × 2 (with or without green tea extract) for 3 weeks. The ducklings were thereafter fed with the regular diets without supplementation of either T-2 or green tea extract. Ducklings fed diets supplemented with pure T-2 were significant decreased of feed intake and lost of down-feather during experimental period ($P < 0.05$). Glutamate oxaloacetate transaminase (GOT) in blood plasma measured at age of 3 wk were increased by dietly supplementation of pure T-2 ($P < 0.05$), which implying that liver function was damaged by T-2. Incidences of delayed first eggs and soft shell eggs were increased ($P < 0.05$) although T-2 contents were not detectable in the eggs produced by the layers grown up from the ducklings fed diets supplemented with T-2. Dietary supplementation of green tea extract could not eliminate the toxicities of T-2. Early intoxication by T-2 toxin will adversely affected the health and growth performances and later production and quality of eggs in Brown Tsaiya duck.

Key Words: T-2 toxin, green tea extract, Brown Tsaiya duck