



台灣素食營養學會

2015 年度學術研討會

不能沒有菌～

細菌與健康研討會

日期：2015 年 12 月 12 日 (週六)

時間：09:30~16:10

地點：花蓮慈濟醫院 協力講堂

主辦單位：台灣素食營養學會

花蓮慈濟醫院

花蓮縣營養師公會

協辦單位：慈濟大學醫學院

時間	題目	講師	主持人
9:30 – 9:50	報到 (Sign-in / Registration)		
9:50 – 10:00	致詞	楊仁宏院長/ 慈濟大學醫學院	
10:00 – 10:50	畜牧業與抗生素抗藥性: 現況與未來 Antibiotic resistance in livestock industry: current situation and future perspective	Mark Wahlqvist, MD Emeritus Professor, Monash University, Australia	楊仁宏院長 / 慈濟大學醫學院
10:50 – 11:40	腸道菌相與抗藥性抗生素 Microbiome and antibiotic resistance	蘇理盈醫師 慈濟醫院	
11:40 – 13:00	蔬食午餐 (Plant-based Lunch)		
13:00 – 13:50	素食如何影響腸道菌相 How does vegetarian diet affect microbiome?	葉綠舒助理教授 慈濟大學	邱雪婷秘書 長/ 台灣素食營養學會
13:50 – 14:40	食物發酵的科學與實務 The science and practice of fermenting food	尤仁音助理教授 慈濟大學	
14:40 – 15:10	休息 (Tea break)		
15:10 – 16:10	發酵實作 Fermentation workshop	尤仁音助理教授 慈濟大學	邱雪婷秘書 長

## 講師簡介

### Professor Mark Wahlqvist

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Professor Mark Wahlqvist AO BMedSc, MD, BS (Adelaide), MD (Uppsala) received his early education at Westbourne Park Primary School and Unley High School in Adelaide, Australia. He has practised first Family Medicine and then Internal Medicine for most of his career, while being actively involved in Public Health. He is a Fellow of the Royal Australasian College of Physicians, the Australian Faculty of Public Health Medicine, the Nutrition Society of Australia, the American College of Nutrition, the Australian Institute of Food Science and Technology and the Australian Academy of Science, Technology and Engineering. He holds several university appointments and is Emeritus Professor of Medicine at Monash University, Director of the Fuli Institute at Zhejiang University, Hangzhou, China and Visiting Professor at the National Health Research Institutes, Taiwan. He has been Chair of the National Nutrition Committee of the Australian Academy of Science, a Board member of ANZFA (now FSANZ), a member of the World Health Organization Nutrition Advisory Committee, member of the Harvest Plus Biofortification Committee, is a Past President of the International Union of Nutritional Sciences, on the Advisory Committee of the Riddet Institute in NZ and is the Founding Editor-in-Chief of the Asia Pacific Journal of Clinical Nutrition. His studies have ranged over food patterns, metabolic disorders, the nature and determinants of disease, and ageing. He has several hundred peer-reviewed publications and a score of books. He is a Life Member or Fellow of Nutrition Australia, the British Nutrition Society and the Taiwanese Nutrition Society. He has received the Swedish Emigrants Institute Charlotta medal, been made an Honorary Batakese for contributions to the health of Indonesian women, been the McCollum International Lecturer of the American Society of Nutrition and made a distinguished Foreign Fellow of the Chinese Nutrition

Society and is an Officer of the Order of Australia. His recreational interests are reading, walking, nature and music, his outlook a religious but spiritual, and his family his devotion.

## 蘇理盈醫師

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現職：花蓮慈濟醫院外科加護病房

學歷：高雄醫學院醫學系

經歷：急救加護醫學會理事

中華民國重症醫學會副秘書長

ACLS 指導員

重症指導醫師

專長：麻醉，疼痛處理，重症營養



## 葉綠舒助理教授

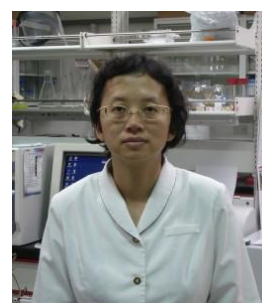
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現職：慈濟大學生命科學系助理教授

學歷：Tulane University 杜蘭大學 Biochemistry 生化研究所

經歷：沙克研究所博士後研究員

專長：生物化學、植物生理學



## 尤仁音助理教授

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現職：慈濟大學醫學檢驗生物技術學系助理教授

學歷：陽明大學微生物暨免疫學研究所

經歷：國防醫學院血液腫瘤科博士後研究員

專長：生物技術、微生物免疫



## 課程摘要

### **Antibiotic resistant genes (ARGs) threaten food and health security**

Prof Mark L Wahlqvist AO

MD (Adelaide, MD (Uppsala) FRACP FAFPHM FAIFST FACN FTSE

*Fuli Institute, Zhejiang University, China; NHRI Taiwan; Monash University, Melbourne, Australia*

It was in the 1940s that the first nature-derived antibiotic, penicillin, was discovered and developed by Fleming, Florey and Chain. However, synthetic antibacterial substances, the sulphonamides, were already known in the 1930s. Since then, millions of lives, especially of soldiers in war-time, children, and the elderly, have been saved by their use. Disturbingly, in retrospect, it was also found that antibiotics were, indirectly, growth promotants by way of reducing or eliminating the microbiome of farm animals. This practice was encouraged and 'regulated' in the 1950s and thereafter by laws in Britain, the USA and elsewhere. By the 1960s problems of antibiotic resistance were becoming a feature of medical practice and inappropriate use in human medicine discouraged, although scarcely at all in veterinary medicine and not at all in animal production. As well, OTC (over-the-counter) antibiotics proliferated in developing economies.

The recent problems of multiple resistant micro-organism in medical centres is being actively addressed with strict hygiene and barrier nursing. But still, many

establishments are at 'the end of the line' with resistance to all but a very few antibiotics like vancomycin. It is now clear that the community is an important source of such multiply resistant micro-organisms and that includes farms and farm animals. Among the most contributory sources of ARGs in travellers are Vietnam and mainland China, so much so that trans-rectal surgical procedures for prostate disease in men who have been there are regarded as high risk. Tragically, the risk-benefit of widespread use of antibiotics as growth promotants is not appreciated. The increase in animal flesh with this practice is only about 2-3% while the farm animals are, designedly, immuno-compromised and prone to infectious disease – and the farming communities and those connected to them are at risk of untreatable infections. Pigs and fish are the best studied for ARGs. In China, about 45% of pigs have multiple ARGs and similar problems exist in the USA. Some of the high mortality in recent times among piglets in the USA and in pig farms around Shanghai are likely to be related to this problem. At any time a major outbreak of farm animal infection may occur and decimate important food sources. Less well understood is the risk to ruminant sheep and cattle and to poultry. Where traditional farm recycling practices were usual and antibiotics not used, the animal microbiomes will have been different and perhaps more resilient, although the information is scant. What we originally called antibiotics were naturally produced by soil micro-organisms in ecosystems where mechanisms

rapidly develop in other micro-organisms to counter them.

It would be useful to know what current food waste management programs, where pigs are fed treated waste, as in Taipei, may allow insofar as ARGs are concerned. Gut health in us and our animals depends on how we were born, where we live, what we eat, and with what we are treated. In turn, we now know that the gut microbiome and its health plays a role in our overall energy balance, immune function and even brain function and mood.

### Readings

1. Peter Collignon, Henrik C. Wegener, Peter Braam, and Colin D. Butler  
The Routine Use of Antibiotics to Promote Animal Growth Does Little to  
Benefit Protein Undernutrition in the Developing World  
Clinical Infectious Diseases 2005; 41:1007–13

2. Yong-Guan Zhua, Timothy A. Johnson, Jian-Qiang Sua, Min Qiao,  
Guang-Xia Guo, Robert D. Stedtfeld, Syed A. Hashsham, and James M.  
Tiedje,

Diverse and abundant antibiotic resistance genes in Chinese swine farms. PNAS |  
February 26, 2013 | vol. 110 | no. 9 | 3435–3440

# 腸道菌相與抗藥性抗生素

蘇理盈醫師

人類的腸道菌落因不同的生產途徑，生活地點，飲食習慣等不同而有差異，腸道的菌落跟宿主的共生關係對宿主的身體健康有著重要的影響，從益菌幫助宿主消化到致病菌引起病人發生嚴重的感染症。腸道的菌落組成也是被宿主所在的環境所影響，特別在使用針對微生物的抗生素後，腸道的菌種更可能大量改變，而在現今的文明下，我們每天都有意或無意的接觸到抗生素。在這些情況下，最讓人擔心的是在濫用抗生素後，多重抗藥性的細菌被選擇出來。當這類抗藥性的細菌因各種原因造成宿主感染炎症時，病人便會遇到無藥可用的困境。

# 素食如何影響腸道菌相

葉綠舒助理教授

最近這些年研究腸道菌的人越來越多，也發現吃素的動物跟吃肉的動物的腸道菌族群是不一樣的。研究團隊找了六個男人、四個女人，讓他們吃葷或吃素；研究團隊收集了飲食改變前四天以及飲食開始改變後接著六天的檢體，檢測裡面的菌相。

結果發現，在食物到達腸道的一天後，腸子裡的細菌族群就開始改變。素食對族群的影響不大，葷食的影響比較顯著。葷食會讓腸道裡可以抵抗膽汁的細菌變多，包括 *Alistipes*、*Bilophila* 以及 *Bacteroides* 這幾屬的細菌。葷食另外還會讓代謝碳水化合物的細菌（主要是厚壁菌門 *Firmicutes*）變少。

另外，食物裡含有的微生物，包括起司與醃肉的菌（*Lactococcus lactis*, *Pediococcus acidilactici* 與 *Staphylococcus*）都可以在腸子裡存活一段時間；甚至連菠菜的病毒 *Rubus chlorotic mottle virus* 都可以短暫地在腸道裡存活。

為什麼改變飲食會使腸道菌族群產生這麼大的改變呢？可能是在古代，能夠採食到什麼要看運氣、看季節，所以不只是我們的代謝需要隨機應變，連腸道菌也需要隨機應變，否則有大餐可吃，卻因為腸道菌無法應變造成消化不良，在洪荒時代應該是不利生存的。

最後，研究團隊發現吃肉會使糞便中膽酸的組成改變，尤其是去氧膽酸（DCA，

deoxycholic acid ) 在食肉者的糞便中的量變多了。去氧膽酸是一種致癌物，被認為與肝癌有關。另外，食肉者的腸道中的 *Bilophila wadsworthia* 這隻菌也變多了，而這隻菌已經在小鼠中被發現可以導致炎症性腸病 ( Inflammatory bowel disease，包括克隆氏症 Crohn's disease 與潰瘍性結腸炎 ulcerative colitis )。

整體來看，素食帶來的好處，比葷食要好多了。

# 食物發酵的科學與實務

尤仁音助理教授

生物進行呼吸作用時，會利用氧將養分分解氧化後，產生能量及水，透過比較無氧與有氧呼吸的代謝作用，讓無氧呼吸時的發酵作用議題引出，再由發酵在生化、工業上及醫學檢驗上的廣義與狹義定義，釐清發酵反應。藉由陳述發酵技術的歷史演進，讓聽眾了解發酵的應用。帶領大家認識發酵作用的過程，目前對於參與發酵作用酵素的了解，以及發酵作用產生的產物介紹，並且討論影響發酵的關鍵，介紹發酵設備的設計。之後將簡介各式發酵食物的製作過程，討論發酵物對生理功能的調節，以及人體腸道免疫的建立模式。最後透過介紹發酵後產物的再利用，說明發酵副產物的開發與應用。

# 蔬果發酵實作

尤仁音助理教授

發酵食物依照穀類、豆類、蔬果類能產生多樣的變化，例如穀類發酵食物：麵包、饅頭、包子、酒、酒釀與醋等，以液態、固液態以及固態呈現。豆類發酵食物：如味噌、納豆、黃豆醬、豆瓣醬、臭豆腐、豆腐乳等則部分用於食物調味。蔬果類發酵食物：如酸黃瓜、泡菜、酸菜、福菜、菜乾、果醋、水果酒等，除了原料的風味還提煉出發酵後的風味。

由於發酵食物的製作過程受到外在條件：如環境、溫度、濕度、水質、甜度及酸度等的影響，而影響到製品的色香味等不同程度上的變化，藉由實際發酵食物的實作，讓課程內容與實務結合，更能體會控制發酵的關鍵因子。

## 緣起

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台灣素食比例高居亞洲之冠，但國內卻尚未有從醫療角度深入探討素食的團體，且仍有許多醫療人員與民眾對素食營養有所疑慮。

<台灣素食營養學會>便是由多位醫療人員、專家學者共同成立，致力於研究素食相關的各種議題，希望扭轉醫療人員與大眾對素食的刻板印象，也透過講座、文宣、研討會，傳播最新資訊。

## 歷屆研討會

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健康、快樂、永續的飲食研討會

飲食、生活型態與失智症的預防與照護研討會

素食生活與心靈健康研討會

台灣食物安全、健康、與永續研討會

飲食營養與過敏性疾病研討會

是過動還是過慮～過動症的營養、醫療、與社會因子

B12 與素食者的健康研討會

不能沒有菌～細菌與健康研討會

## 素食文宣

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活力健康蔬食

素媽媽哺乳營養

這樣吃！可以降低血脂

飲食「鈣」高尚

素食孕婦營養

打敗無形殺手高血壓

蔬食寶寶營養

哺乳計畫



## 2016 計畫

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素食營養趣味動畫 (民眾版)

線上素食營養課程 (專業人員版)

出版素食文宣

## 網站

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臉書：[www.facebook.com/TWVNS](https://www.facebook.com/TWVNS)

## 聯絡方式

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