

## 蘇忠楨 (Jung-Jeng Su) 研究員 (組長)學術著作

(A)期刊論文

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#### (E)研究專利及應用成果

1.蘇忠楨。劉惠群。畜牧用生物除臭反應槽裝置及其方法。中華民國發明第 099641 號。經濟部智慧財產局。

2.蘇忠楨。廢水中腐植酸類物質之過濾吸附與回收系統及方法。中華民國發明第 230695 號。經濟部智慧財產局。

3.蘇忠楨、陳妍蓉。張原志。用於處理含硫化氫沼氣之生物脫硫系統及其生物脫硫方法。中華民國發明專利申請案第 096116957 號。經濟部智慧財產局。

4.蘇忠楨。陳漢棟。沼氣處理設備。中華民國新型專利申請案第 98222544 號。經濟部智慧財產局。

5. 蘇忠楨。陳漢棟。沼氣處理設備。用於處理含硫化氫沼氣之生物脫硫系統及其生物脫硫方法。中華人民共和國新型專利申請案第 200920351510.8 號。國家智識產權局。



6.蘇忠楨。異營性硝化菌與好氧性脫氮菌株及其培養方法(2005) 技術移轉鴻福生態生技公司。

7.蘇忠楨。用於處理含硫化氫沼氣之生物脫硫系統及其生物脫硫方法(2009) 技術移轉翔森生質能源股份有限公司。

8.蘇忠楨。廢水中腐植酸物質之過濾吸附與回收系統及方法(2009) 技術移轉翔森生質能源股份有限公司。

#### (F)個人獎項

1. 2003/12 Academic Award, Chinese Society of Agriculture, ROC (中華農學會學術獎)

2. 2001/12 Academic Award, Chinese Society of Animal Science, ROC (中國畜牧學會學術獎)

3. 2001 Annual Excellent Employee Award, Pig Research Institute Taiwan, ROC (台灣養豬科學研究所優秀員工獎)

4. 1996 - 2000 Research Award , National Science Council, ROC (國科會甲種研究獎金)

5. 1990/1 - 1994/5 Teaching Assistantship, Dept. of Biological Sciences, Rutgers University, USA (美國羅格斯大學生物科學系助教全額獎學金)

#### (G)協助產業技術發展之具體績效

##### 一、廢水處理技術與環境生物技術之研發：

##### (一) 自動化分批式養豬廢水處理系統研發：

提升養豬場廢水處理效率，減少操作人力，系統操作簡單且處理效果穩定。1995 至 1996 年間在執行新竹縣環保局計畫，完成首次之實廠規模廢水處理系統效益評估，並於 1996 年 6 月出版自動化分批式廢水處理系統操作手冊，提供養豬業者參考使用。本技術提升畜牧場廢水處理效率 50%以上，節省處理成本 1/3。

##### (二) 養豬廢水除氮技術研發：

1. 國內首次證明養豬廢水中亞硝酸氮會干擾化學需氧量之檢測值，可以提供養豬業者調整操作管理程序與廢水檢測機構檢驗水樣之參考。

2. 利用環境生物技術分離出好氧性脫氮菌 *Ps. stutzeri* SU2 及異營性硝化菌 *Ps. alcaligenes* SU3，除已發表 SCI 期刊論文(Su et al., 2001abc)，已經於 2005 年技術移轉給鴻福生態生技公司，此技術可以提升廢水處理系統對於廢水之除氮效率達 40%以上。

(三) 養豬場放流水中腐植酸回收利用技術研發：

2004 年首次證明養豬場放流水中 70%以上之難分解有機質(即化學需氧量)為腐植酸，並提出降低養豬場放流水中化學需氧量之方法，以協助養豬產業之永續經營。2005 年取得中華民國發明專利『廢水中腐植酸類物質之過濾吸附與回收系統及方法』(發明第 I230695 號)，並於 2009 年 11 月 16 日技術授權翔森生質能源股份有限公司。本技術可以有效降低放流水中 50~70%化學需氧量，使畜牧場之放流水更容易符合環保署標準。

二、畜舍除臭技術研發：

1997 年研發生物除臭系統應用於畜牧業臭氣處理，並於 1998 年取得中華民國發明專利『畜牧用生物除臭反應槽裝置及其方法』(發明第 099641 號)，對於密閉式畜舍之臭氣平均去除率可達 90%以上。2006 年起將此除臭生物濾床技術改良，並應用於畜牧場產生之沼氣中硫化氫之生物濾床去除技術之研發。

三、畜牧場溫室氣體與再生能源利用技術研究：

(一) 發表我國首次畜牧業廢水處理所產生之溫室氣體產量資料：

建立畜牧業廢水處理所產生之溫室氣體產量本土實際檢測基本資料，為國內第一篇發表在國外研究期刊(Su et al., 2003)，有關我國畜牧業廢水處理所產生之溫室氣體產量本土實際檢測之排放係數，為我國唯一可以提供國際組織參酌之畜牧業溫室氣體產量資料。

(二) 國內首次將飼料添加劑應用於廢水厭氣處理之溫室氣體減量研究：

可以有效降低厭氣處理所產生之甲烷產量，且不會造成廢水處理系統內有益微生物族群之傷害而影響處理後之水質(Su et al., 2004)。本技術可以有效降低甲烷產生量 80%以上，有效降低畜牧業溫室氣體產量。

(三) 提升畜牧場再生能源(沼氣)利用技術之研發：

2009 年起積極研發畜牧場沼氣生物脫硫技術，可以有效將沼氣中具腐蝕性之硫化氫，以生物濾床方式將硫化氫完全去除。並於苗栗縣養豬場內設置沼氣生物脫硫設施，生物脫硫槽正常操作情況下，硫化氫之平均去除率可以達到 90%以上。本技術將可以鼓勵國內畜牧場對於廢棄物資源回收利用之意願，提升畜牧場內 50%之沼氣利用率，進而降低畜牧場內 50%之溫室氣體排放量，促進畜牧產業之永續發展，達到產業發展與環保雙贏之目的。

四、研發成果產業化：

(一) 協助鴻福生態生技公司於 2005 年申請到經濟部工業局「生物技術研發成果產業化推動計畫」，計畫名稱為「水產養殖用異營性硝化菌與好氧性脫氮菌之生物製劑開發」，計畫執行期限 2005.10.1~2007.9.30。

- (二) 協助翔森生質能源股份有限公司於 2009 年申請到經濟部工業局「生物技術研發成果產業化推動計畫」，計畫名稱爲「沼氣生物濾床脫硫及沼氣利用系統之產業化技術開發」，計畫執行期限 2009.4.1~2010.3.31。  
2009 年實廠規模之沼氣生物脫硫系統，已經在 3 戶養豬場試驗使用中。
- (三) 協助翔森生質能源股份有限公司於 2009 年申請到經濟部工業局「生物技術研發成果產業化推動計畫」，計畫名稱爲「以畜牧場廢水產製腐植酸並混合生物菌群量產有機腐植酸生物肥料」，計畫執行期限 2009.10.1~2010.9.30。