

## บรรณานุกรม

- กฤตพล สมมาตย์, เมธा วรรณพัฒน์, ฉลอง วชิราภากรและเวชสิทธิ์ โภบุราณ. 2534. ความสามารถในการย่อยสลายอินทรีย์วัตถุของอาหารหลังงานในกระเพาะหมักของโค และกระปือปลัก. การประชุมวิชาการมหาวิทยาลัยเกษตรศาสตร์ ครั้งที่ 29 มหาวิทยาลัยเกษตรศาสตร์ บางเขน กรุงเทพฯ
- เกรียงศักดิ์ สถาปนศิริ. 2533. การย่อยได้ของแป้งจากข้าวเจ้าบด ปลาข้าวบด และมัน สำปะหลังในแต่ละส่วนของทางเดินอาหารโคนมสาว. วิทยานิพนธ์ปริญญาโท มหาวิทยาลัยเกษตรศาสตร์.
- ฉลอง วชิราภากร. 2541. โภชนาศาสตร์ และการให้อาหารสัตว์เมืองต้น. ขอนแก่น: ภาควิชา สัตวศาสตร์ คณะเกษตรศาสตร์ มหาวิทยาลัยขอนแก่น.
- พจน์ ศรีบุญลือ, ไสพิศ วงศ์คำ, พชรี บุญศิริ และ ประสรงค์ คุณานุวัฒน์ชัยเดช. 2540. ตำราชีวเคมี. ภาควิชาเคมี. คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น.
- เมธा วรรณพัฒน์. 2533. โภชนาศาสตร์สัตว์เคี้ยวเอื้อง. หจก.ฟันนี่พลับลิชชิ่ง, กรุงเทพมหานคร.
- เมธा วรรณพัฒน์, ฉลอง วชิราภากร, กฤตพล สมมาตย์, สุทธิพงศ์ อุริยะพงศ์สารค์, โภคัส พิมพา และเวชสิทธิ์ โภบุราณ. 2538. การใช้มันสำปะหลังเป็นอาหารสัตว์. ภาควิชา สัตวศาสตร์ คณะเกษตรศาสตร์ มหาวิทยาลัยขอนแก่น.
- สำนักงานเศรษฐกิจการเกษตร. 2548. กระเทียม. ค้นเมื่อ 30 พฤษภาคม 2549 จาก <http://www.oae.go.th/mis/Forecast/MAR49/type/14gallic49.htm>
- สาโรจน์ คำเจริญ, สิงหนาท พวงแดง, เยาวนาลย์ คำเจริญ และ เจนถู จิวakanan. 2547. การ พัฒนาใช้สมุนไพรกระเทียมเพื่อเป็นสารต้านจุลินทรีย์และวัตถุเติมในอาหารสำหรับ อุตสาหกรรมการเลี้ยงไก่และสุกร. รายงานการวิจัยฉบับสมบูรณ์ประจำปีงบประมาณ 2545.
- Amagase, H. Brenda, L. Petesch, H. Masuura, S. Kasuga and Y. Itakura. 2001. Intake of garlic its bioactive component. J. Nutri. 131: 955S-962S.
- AOAC. 1990. **Official Methods of Analysis**. 15th edn. Association of Official Analytical Chemists, Virginia.

- Aroeira, L. J. M., F. C. F. Lopes and M. D. Dayrell. 1996. Rumen degradability of some feeds in the rumen of Holstein-Zebu crossbred cows. Revista Da Sociedade Brasileira De Zootecnia Journal of the Brazilian Society of Animal Science. 25:1178-1186.
- Barry, T. N. and T. R. Manley. 1984. The role of condensed tannins in the nutritional value of *Lotus pedunculatus* of sheep 2. Quantitative digestion of carbohydrates and proteins. Br. J. Nutr. 51:493-498.
- Beauchemin, K. A. and S. M. McGinn. 2006. Methane emissions from beef cattle: Effects of fumaric acid, essential oil and canola oil. J. Anim. Sci. 84 :1489.
- Benchaar, C., H. V. Petit, R. Berthiaume, T. D. Whyte and P. Y. Chouinard. 2006. Effects of addition of essential oils and monensin premix on digestion, ruminal fermentation, milk production, and milk composition in dairy cows. J. Dairy Sci. 89: 4352–4364.
- Bhatta, R., K. Tajima and M. Kurihara. 2006. Influence of temperature and pH on fermentation pattern and methane production in the rumen simulating fermenter (RUSITEC). Asian-Aust. J. Anim. Sci. 19: 376.
- Boniface, A. N., R. M. Murray and J. P. Hogan. 1986. Optimum level of ammonia in the rumen liquor of cattle fed tropical pasture hay. Proc. Aust. Soc. Anim. Prod. 16: 151-154.
- Busquet, M., S. Calsamiglia, A. Ferret and C. Kamel. 2005a. Plant extracts affect *in vitro* rumen microbial fermentation. J. Dairy Sci. 89: 761.
- Busquet M., S. Calsamiglia, A. Ferret, M. D. Carro and C. Kamel. 2005b. Effect of garlic oil and four of its compounds on rumen microbial fermentation. J. Dairy Sci. 88: 4393.
- Busquet M., S. Calsamiglia, A. Ferret and C. Kamel. 2006. Plant extracts affect *In Vitro* rumen microbial fermentation. J. Dairy Sci. 89: 761.
- Cardozo, P. W., S. Calsamiglia, A. Ferret and C. Kamel. 2004. Effects of natural plant extracts on ruminal protein degradation and fermentation profiles in continuous culture. J. Anim. Sci. 82: 3230.

- Cardozo, P. W., S. Calsamiglia, A. Ferret and C. Kamel. 2005. Screening for the effects of natural plant extracts at different pH on in vitro rumen microbial fermentation of a high-concentrate diet for beef cattle. *J. Anim. Sci.* 83:2572.
- Castillejos, L., S. Calsamiglia and A. Ferret. 2006. Effect of essential oil active compounds on rumen microbial fermentation and nutrient flow in *in vitro* systems. *J. Dairy Sci.* 89: 2649–2658.
- Chanthai, S., M. Wanapat and C. Wachirapakorn. 1989. Rumen ammonia-N and volatile fatty acid concentrations in cattle and buffalo given rice straw-based diets. In: Proc. 7<sup>th</sup> AFAR Int. Workshop. (Ed. R. Dixon), IDPd, Canberra, Australia.
- Chanthai, S., M. Wanapat and C. Wachirapakorn. 1987. Rumen ammonia-N and Volatile fatty acid concentration in cattle and buffalo give rice straw based diet. Paper presented at The International Works shop of the 7<sup>th</sup> Annual Meeting, Australian-Asian Fibrous Agricultural Residues Research Network, held at Chaingmai, Thailand June 2-6.
- Chanthai, S., M. Wanapat and C. Wachirapakorn. 1988. Rumen ammonia –N and volatile fatty acids Concentrate in cattle and buffaloes given rice straw evaluation. In: Proc. Ruminants Feeding System Utilizing Fibrous Agriculture Residue. Khon Kaen University.
- Chen, X. B., D. J. Kyle and E. R. Orskov. 1993. Measurement of allantoin in urin and plasma by high-performance liquid chromatography with pre-column derivatization. *J. Chromatography.* 617: 241-247.
- Chujula, P., M. Wanapat, C. Wachirapakorn, S. Uriyapongson and P. Rowlinson. 2002. Ruminal degradability of tropical feeds and their potential use in ruminant diets. *Asian-Aust. J. Anim. Sci.* 15:114-119.
- Chujula, P., M. Wanapat, C. Wachirapakorn, S. Uriyapongson and P. Rowlinson. 2003. Ruminal degradability of tropical feeds and their potential use in ruminant diets. *Asian-Aust. J. Anim. Sci.* 16:211-216.

- Chesworth, J.M., T. Stuchbury and J.R. Scaife. 1998. **An introduction to agricultural biochemistry**. Chapman & Hall, New York.
- Delgado, C., M. Rosegrant, H. Steinfeld, S. Ehui and C. Courbois. 1999. **Livestock to 2020:The next food revolution**. IFPRI/FAO/ILRI. Food Agriculture and the Environment. Discussion paper 28.
- Demeyer, D. I. 1981. **Rumen microbes and digestion of plant cell walls**. Agric. Environ. 6: 295-337.
- Demeyer, D. I., C. Van Nevel, E. Teller and J. M. Godeau. 1986. **Manipulation of rumen digestion in relation to the level of production in ruminants**. Arch. Anim. Nutr. 36: 132.
- Devendra, C. 1992 **Non-Conventional Feed Resources in Asia and the Pacific (4<sup>th</sup> Ed.)** O/RAPA, Bangkok. Doyle, P.T., Devendra, C. and Pearce, G.R. 1986. Rice straw as a feed for ruminants. International Development Program of Australian Universities and Colleges (IDP), Canberra, Australia, 117 pp.
- Erdman, R. A., G. H. Proctor and J. H. Vandersall. 1986. **Effect of rumen ammonia concentration on in situ rate and extent of digestion of feedstuffs**. J. Dairy Sci. 69: 2312-2320.
- Gibbs, M. and D. E. Johnson. 1994. **Methane emissions from the digestive processes of livestock**. In: Int. Anthropogenic Methane Emissions Estimates for 1990. U.S. EPA 230-R-93-010. Jan. 1994.
- Gottschalk, G. 1986. **Bacterial Metabolism**. 2<sup>nd</sup> ed. Springerverage, New York, NY.
- Granum, G.M., M. Wanapat, P. Pakdee and C. Wachirapakorn. 2002. **The effect of cassava hay supplementation on weight change, dry matter intake, digestibility and intestinal parasites in swamp buffaloes (*Bubalus bubalis*) and cattle (*Bos indicus*)**. In Proc. Agriculture Conference, Narasuan University, Pitsanuloke, Thailand, July 26–30.
- Granum, G., M. Wanapat, P. Pakdee, C. Wachirapakorn and W. Tobura. 2007. **A Comparative Study on the Effect of Cassava Hay Supplementation in Swamp**

- Buffaloes (*Bubalus bubalis*) and Cattle (*Bos indicus*). Asian-Aust. J. Anim. Sci.**  
2007: (In-press).
- Hart, F. and M. Wanapat. 1992. **Physiology of urea-treated rice straw in swamp buffalo.**  
Asian-Aust. J. Anim. Sci. 5:617-622.
- Hino, T. and J.B. Russell. 1987. **Relative contribution of ruminal bacteria and protozoa to the degradation of protein in *vi tro*.** J. Anim. Sci. 64 : 261.
- Helmer, L. G., E. E. Bartley and C. W. Deyoe. 1970. **Feed processing. VI. Comparison of starea, urea, and soybean meal as protein source for lactating dairy cow.** J. Dairy Sci. 53: 883.
- Hong, N. T. T., M. Wanapat, C. Wachirapakorn, P. Pakdee and P. Rowlinson. 2003. **Effects of timing of initial and subsequent cutting on yields and chemical compositions of cassava hay and its supplementation on lactation dairy cows.** Asian-Aust. J.Anim. Sci. 16: 1763-1769.
- Hungate, R. E. 1966. **The rumen and its microbes.** Academic press, New York, USA.
- Johnson, R. M. and W. D. Raymond. 1965. **The chemical composition of some tropical food plants.** Anim. Feed Sci. Technol. 3:345.
- Kahn, L. P. and A. Diaz-Hernandez. 2000. **Tannins with anthelmintic properties.** In:**Proc. International Workshop on Tannins in Livestock and Human Nutrition.** (Ed. J. D. Brooker), ACIAR Proceedings No. 92. 171 pp.
- Kanjanapruthipong and R. A. Leng. 1998. **The effects of dietary urea on microbial populations in the rumen of sheep.** Asian-Aust. J. Anim. Sci. 11: 661-672.
- Khampa, S. and M. Wanapat. 2004. **Effect of levels of supplementation of concentrate containing high levels of cassava chip on rumen ecology, microbial nitrogen supply and digestibility of nutrients in cattle.** KKU. Research Journal (Graduate Studies). 3:1-13.
- Khampa, S., M. Wanapat, C. Wachirapakorn, N. Nontaso and M. Wattiaux. 2005. **Effect of levels of malate supplementation on ruminal fermentation efficiency in concentrate containing high levels of cassava chip in dairy steers.** In: Proceedings

of the graduate school . Congress VII. Held at Graduate school Khon Kaen University, 21 January 2005, Pp9-10.

Khampa, S., M. Wanapat, C. Wachirapakorn, N. Nontaso and M. Wattiaux. 2006. Effect of levels of sodium dl-malate supplementation on ruminal fermentation efficiency in concentrates containing high levels of cassava chip in dairy steers. Asian-Australasian Journal of Animal Sciences Vol. 19 No. 3: 368-375.

Khampa, S., M. Wanapat, C. Wachirapakorn, N. Nontaso and M. Wattiaux. 2006. Effects of urea level and sodium dl-malate in concentrate containing high cassava chip on ruminal fermentation efficiency, microbial protein synthesis in lactating dairy cows raised under tropical condition. Asian-Australasian Journal of Animal Sciences Vol. 19 No. 6: 837-844.

Khampa, S., M. Wanapat, C. Wachirapakorn, N. Nontaso and M. Wattiaux. 2006. Effects of energy sources and level of supplementation on ruminal fermentation and microbial protein synthesis in dairy steers. Songklanakarin Journal of Science and Technology Vol. 28 (2): Mar-Apr: 265-276.

Koakhunthod, S., M. Wanapat, C. Wachirapakorn, N. Nontaso, P. Rowlinson and N. Sornsungnern. 2001. Effect of cassava hay and high-quality feed block supplementation on milk production in lactating dairy cows. International Workshop Current Research and Development on Use of Cassava as Animal Feed. Khon Kaen University, Thailand. July 23 – 24, 2001.

Krause, D. O., B. P. Dalrymple, W. J. M. Smith, R. I. Mackie and C. S. McSweeney. 1999. 16S rRNA sequencing *Ruminococcus albus* and *Ruminococcus flavefaciens*:design of a signature probe and its application in adult sheep. Microbiology. 145: 1797-1807.

Krause, D. O., W. J. M. Smith, F. M. E. Ryan, R. I. Mackie and C. S. McSweeney. 2000. Use of 16S-rRNA based techniques to investigate the ecological succession of microbial populations in the immature lamb rumen: tracking of a specific strain of inoculated *Ruminococcus* and interactions with other microbial populations in vivo. Microb. Ecol. 38: 365-376.

- Krebs G. and R. A. Leng. 1984. **The effect of supplementation with molasses urea blocks on ruminal digestion.** Proc of the Australian Society of Animal Production 15: 704.
- Kunju P. J. G. 1986. **Urea molasses block lick: A feed supplement for ruminants.** In: Ibrahim. (Eds., M. N. M. and J. B. Scheire), Rice Straw and Related Feeds in Ruminant Rations. Proc of International Workshop, Kandy, Sri Lanka, 24-28 March 1986. Pp 261-274.
- Lana, P. Rogerio, James B. Russell and M. E. Van Amburgh. 1998. **The role of pH in regulation ruminal methane and ammonia production.** J. Anim. Sci. 76: 2190-2196.
- Leng, R. A. 1999. **Feeding strategies for improving milk production.** In: Smallholder Dairying in the Tropics (Eds., L. Falvey and C. Chantalakhana). International Livestock Research Institute (ILRI), Nairobi, Kenya. 462 pp.
- Makkar, H. P., M. Blummel and K. Becker. 1995. **In vitro effects of and Interactions between tannins and saponins and fate of tannins in the rumen.** J. Sci. Food Agric. 69: 481-493.
- Martin, S. A. 1998. **Manipulation of the ruminal fermentation with organic acid: A review.** J. Anim. Sci. 76: 3123-3132.
- McSweeney, C. S., B. Pulmer, D. M. McNeill and D. O. Krause. 2001. **Microbial interacttions with tannins : nutritional consequences for ruminants.** Anim. Feed Sci. Techn. 91: 83-93.
- Mehrez, A. Z., E. R. Orskov and I. McDonald. 1977. **Rates of rumen fermentation in relation to ammonia concentration.** Br. J. Nutr. 38:437-443.
- Menke, K. H. and H. Steingass. 1988. **Estimation of the energetic feed value obtained from chemical analysis and *in vitro* gas production using rumen fluid.** Animal Research and Development. 28:7-55.
- Miron, J., C. Ben-Ghedalia and M. Morrison. 2001. **Adhesion mechanisms of rumen cellulolytic bacteria.** J. Dairy Sci. 84: 1294-1309.
- Moat, A.G. and J.W. Foster. 1995. **Microbial Physiology.** Wiley-Liss Publisher. New York, USA. 580p.

- National Research Council. 1976. Nutrient requirement of beef cattle. National Academy of Science. Washington D.C., U.S.A.
- Netpana, N, M. Wanapat, O. Poungchompu and W. Tolouran. 2001. Effect of condensed tannins cassava hay on fecal parasitic egg counts in swamp buffaloes and cattle. International Workshop Current Research and Development on Use of Cassava as Animal Feed. Khon Kaen University, Thailand. July 23 – 24, 2001.
- Nisbet, D. J. and S. A. Martin. 1994. Factors affecting L-lactate utilization by *Selenemonas ruminantium*. J. Anim. Sci. 72:1355-1361.
- Nocek, J. E. and S. Tamminga. 1991. Site of digestion of starch in the gastrointestinal-tract of dairy cows and its effect on milk-yield and composition. J. Dairy Sci. 74: 3598-3629.
- Nguyen V. T. and T. R. Preston. 1999. Rumen environment and feed degradability in swamp buffaloes fed different supplements. Livestock Res for Rural Dev. 11: <http://www.Cipav.Org.co/lrrd/lrrd11/3/thu113.htm>.
- Odenyo, A. A., R. I. Mackie, D. A. Stahl and B. A. White. 1994a. The use of 16S rRNA-targeted oligonucleotide probes to study competition between ruminal fibrolytic bacteria: development of probes for *Ruminococcus* species and evidence for bacteriocin production. Appl. Environ. Microbiol. 60: 3688-3696.
- Odenyo, A. A., R. I. Mackie, D. A. Stahl and B. A. White. 1994b. The use of 16S rRNA-targeted oligonucleotide probes to study competition between ruminal fibrolytic bacteria: pure-culture studies with cellulose and alkaline peroxide-treated wheat straw. Appl. Environ Microbiol. 60: 3697-3703.
- Orskov, E. R. and H. J. Flint. 1989. Manipulation of rumen microbes or feed resources as methods of improving feed utilization. In: Proc. The Biotechnology in Livestock in Developing Countries (Ed., A. G. Hunter), Rkitchie of Edinburgh Ltd., United Kingdom.

- Paengkoum, P. 1998. Effects of dietary carbohydrate and /or by-pass protein on voluntary feed intake, digestibility and ruminal fermentation in dairy cattle fed rice straw and urea-treated rice straw as roughages. M.Sc. Thesis, Khon Kaen University, Thailand 122 pp.
- Plaizier, J. C. B., R. Nkya, M.N. Shem, N. A. Uri and B. W. McBride. 1999. Supplementation of dairy cows with nitrogen molasses mineral blocks and molasses urea mix during the dry season. Asian-Aust. J. Anim. Sci. 12: 735-741.
- Preston, T. R. and R. A. Leng. 1987. Matching Ruminant Production Systems with available Resources in the Tropics and Sub-Tropics. Br. J. Nutr. 2: 199-208.
- Reed, J. D. 1995. Nutritional toxicology of tannins and related polyphenols in forage legumes. J. Anim. Sci. 73:1516-1528.
- Reed, J. D., E. McDowell, P. J. Van Soest and P. J. Horvath. 1982. Condensed tannins: A factor limiting the use of cassava forage. J. Sci. Food Agric. 33: 213-220.
- Rihani, N., W. N. Garrett and R. A. Zinn. 1993. Influence of level of urea and method of supplementation on characteristics of digestion of high-fiber diets by sheep. J. Anim. Sci. 71: 1657-1665.
- Robinson, P. H., R. E. McQueen and P. L. Buress. 1991. Influence of rumen undegradable protein levels on feed intake and milk production of dairy cows. J. Dairy Sci. 74: 1623-1631.
- Robinson, P. H., J. G. Fadel and M. Ivan. 1996. Critical evaluation of diaminopimelic acid and ribonucleic acid as markers to estimate rumen pools and duodenal flows of bacteria and protozoal nitrogen. Can J. of Anim. Sci. 76: 587-597.
- Russell, J. B. and H. J. Strobe. 1987. Concentration of ammonia across cell membrane of mixed rumen bacteria. J. Dairy Sci. 70: 970-976.
- Satter, L. D. and L. Slyter. 1974. Effect of ammonia concentration on rumen microbial protein production in vitro. Brit. J. Nutr. 32: 199.
- Schmidt, S.P., N.A. Jorgenson., N.J. Benevenga and V.H. Brungardt. 1972. Comparison of soybean meal,formaldehyde treated soybean meal, urea and starch for steers. J. Anim. Sci. 37: 1233.

- Wanapat, M., K.Sommart, O.Pimpa and S. Boonsorn. 1996. **Supplementation of high quality feed pellet to increase milk productivity at small-holder farmer's level.** In: Proc. The 8<sup>th</sup> AAAP Animal Sciecne Congrees, Japanese Society of Zootechnical Sci., Tokyo, Vol 2:158.
- Wanapat, M., O. Pimpa, A. Petlum and C. Wachirapakorn. 2000a. **Participation scheme of smallholder dairy farmers in the northeast Thailand on improving feeding systems.** Asian-Aust. J. Anim. Sci. 13: 830-836.
- Wanapat, M., O. Pimpa, A. Petlum and U. Boontao. 1997. **Cassava hay: A new strategic feed for ruminants during the dry season.** Livestock Research for Rural Development 92): LRRD Home Page.
- Wanapat, M., O. Pimpa, K. Sommart, S. Uriyapongson, W. Toburan, D. Parker and P. Rowlinson. 1995. **Effects of energy sources on rumen fermentation, degradability and rice straw intake in swamp buffaloes.** In: Proc. The International Workshop on Draft Animal Power, Khon Kaen University, Khon Kaen, Feb. 13-17, 1995.
- Wanapat, M., O. Pimpa. W. Sripuek, T. Puramongkol, A. Petlum, U. Boontao, C. Wachirapakorn and K. Sommart. 1998. **Cassava hay, a potential feed for ruminants.** In: Proc. Internatinal Conference on Food, Lands and Livelihoods : Setting Research Agendas for Animal Science, the British Society of Animal Science, Jan 27-30, 1998, organiaed at the Agricultural Research Institute, Nairobi, Kenya.
- Wanapat, M., S. Khampa, A. Pongchompu, S. Wanapat and Y. Sai-ngarm. 2004. **Effect of cassava hay in high-quality feed block as antheminthics in steers grazing on ruzi grass.** In: New dimentions and challenges for sustainable livestock farming. Proceedings of the 11<sup>th</sup> Animal Science Congress, The Asian-Australasian Association of Animal Production Societies, 5-9<sup>th</sup> September 2004, Kuala Lumpur, Malaysia.

- Wanapat, M., S. Uriyapongson, S. Chanthai, S. Wanapat, C. Wachirapakorn and K. Thammasing. 1989. **The utilization of dried cassava leaves and urea-treated rice straw for draft swamp buffaloes during the dry season at village level.** In: Proc. The 27<sup>th</sup> Technical Annual Meeting, Kasetsart University, Bangkok, Thailand, pp. 95-107.
- Wanapat, M., T. Puramongkon and W. Siphuak. 2000b. **Feeding of cassava hay for lactating dairy cows during the dry season.** Asian-Aust. J. Anim. Sci. 13:478.
- Wanapat, M., T. Puramongkon and W. Siphuak. 2000c. **Feeding of cassava hay for lactating dairy cows.** Asian-Aust. J. Anim. Sci. 13: 478-482
- Weimer, P. J. 1998. **Manipulating ruminal fermentation: A microbial ecological perspective.** J. Anim. Sci. 76: 3114-3122.
- Zajac, A. M. 1994. **Fecal examination in the diagnosis of parasitism.** In Veterinary clinical parasitology. Eds. M. W. Sloss, R. L. Kemp and A. m. Zajac. Iowa State College Press, Ames, Iowa. Pp. 3-61.
- Zinn, R. A. and E. J. DePeters. 1991. **Comparative feeding value of tapioca pellets for feedlot cattle.** J. Anim. Sci. 69: 4726-4733.

มหาวิทยาลัยราชภัฏมหาสารคาม  
RAJABHAT MAHASARAKHAM UNIVERSITY