

学 位 論 文 要 旨	
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題 目	Studies on Production of Fermented Total Mixed Rations using Regional Bio-resources and its Evaluation, and Establishment of their Feeding System for Dairy Cows (地域資源を活用した発酵混合飼料の飼料特性ならびに乳用牛への給与技術の確立に関する研究)
<p>Recently, fermented total mixed ration (fermented TMR) has been used extensively in dairy farming. In particular, preparation of the TMR using food by-products and its feeding regimen have been investigated by many workers in order to increase the feed self-support ratio. The aims of this study were to clarify the fermentation quality of the fermented TMRs containing sweet-potato shochu distillery by-product cake (SDC), rice whole crop silage (RWCS) or oat/barley silages and changes in chemical composition during fermentation, and to examine the effects of feeding the diets on the nutrient metabolism and milk production of dairy cows.</p> <p>1. Fermentation quality of fermented TMR and change in chemical composition during fermentation: The fermentation qualities of mixed silage comprising roughages, i.e. corn silage (CS), Italian ryegrass silage, RWCS and rice straw with 10 and 20% SDC replaced roughage in a DM basis were more than 90 points in V-SCORE, indicating good quality. The protein content of the mixed silages was increased after preparation. The CS- and RWCS-based fermented TMRs with 10% SDC had good quality. The protein fraction in the fermented TMR varied depending on roughages, but no variation was found in fiber fraction. Of the fermented TMRs including oat hay (OH), oat silage (OS) or barley silage (BS), the OH-based diet revealed the best fermentation quality. Protein and fiber fractions in the TMR were affected by roughages, and variation was greater in the BS-based TMR.</p> <p>2. Nutrient metabolism of dairy cows fed the fermented TMR: Feeding the TMR including SDC mixed silages and CS- and RWCS-based fermented TMR with SDC to dry cows and offering OH-, OS- and BS-based diets to lactating cows had little influence on digestibility or nitrogen utilization. The DM and TDN intake of lactating cows elevated with increasing SDC, but it was not affected by roughages in different fermented TMRs.</p> <p>3. Productivity of dairy cows fed the fermented TMR: Milk production, milk composition and feed efficiency of lactating cows fed the above TMRs were not influenced by roughages. Lactating cows fed the BS-based fermented TMR had higher roughage value index and conjugated linoleic acid in milk than the animals fed the OS-based diet. In addition, feed cost milk receipt ratio tended to be lower in the CS-based fermented TMR than in RWCS-based diet.</p> <p>In conclusion, ensiling regional feed resources such as SDC, RWCS, OS or BS showed good fermentation quality and it was clarified that chemical composition during fermentation varied depending on main roughages. The above TMRs had no influence on digestion and milk production of dairy cows, indicating that the diets were useful for the animals.</p>	