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## Effects of *in vitro* digestibility on grass seeds of different treatments

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**Introduction** The grass seeds which lost seeding value contain higher nutrient value than the hay . However , most of these forage seeds . Thus , the digestibility of the intact forage seeds are low (Shi et al 2006) . So , *in vitro* digestibility of seeds were analyzed with different treatments to provide basis for fodder of the aging seeds .

**Materials and methods** In Oct 2005 , 14 shares of fresh forage seeds were obtained from Ministry of Agriculture , Forestry and Fisheries of Japan . On the base of preceding report (Shi et al 2006) , some forage seeds (Table 1) were treated with 4 different methods : ① The seeds treated with artificial aging for 86h with the conditions of 95-100% (RH) and 43°C , then put them at 130°C for 2h . The aging and fresh seeds were all smashed in grain with the diameter was almost 1.2 mm . ② the intact fresh seeds were put in water at the temperature of 18-23°C for 24h . ③ The conditions same as ② , use waste liquor of amino acid (0.015g . ml<sup>-1</sup> , pH=6.82) for soaking . ④ the seeds were put at 25°C for 3d . Then determine the digestibility with *in vitro* method . The method was the same as preceding report (Shi et al 2006) .

**Table 1** The digestibility of various forage seeds with different treatments .

Name of materials (abbreviation)	Scientific name	Different treatments Control :smash / intact ; Treatment :① / ② / ③ / ④	<i>in vitro</i> gas releasing amount fresh /aging seeds
Creeping fescue(CRF)	<i>Festuca rubra</i> L .	65.27 <sup>a</sup> / 11.90 <sup>c</sup> / 61.49 <sup>b</sup> / - / - / -	139.50 <sup>a</sup> / 123.50 <sup>b</sup>
Perennial rye grass (PRG)	<i>Lolium perenne</i> L .	70.42 <sup>a</sup> / 17.80 <sup>c</sup> / 66.75 <sup>b</sup> / - / - / -	187.12 <sup>a</sup> / 165.48 <sup>b</sup>
Creeping bentgrass (CBG)	<i>Agrostis stolonifera</i> L .	63.61 <sup>a</sup> / 17.60 <sup>c</sup> / 63.95 <sup>b</sup> / - / - / -	140.42 <sup>a</sup> / 135.49 <sup>a</sup>
Orchardgrass cocksfoot (OG)	<i>Dactylis glomerata</i> L .	56.02 <sup>a</sup> / 14.71 <sup>c</sup> / - / 16.84 <sup>b</sup> / 16.54 <sup>b</sup> / 16.42 <sup>b</sup>	123.75 / -
Bahiagrass (BG)	<i>Paspalum notatum</i> Flugge .	32.22 <sup>a</sup> / 10.12 <sup>cd</sup> / - / 10.03 <sup>cd</sup> / 11.19 <sup>bc</sup> / 12.29 <sup>b</sup>	88.67 / -
Alfalfa	<i>Medicago sativa</i> L .	70.35 <sup>a</sup> / 50.68 <sup>b</sup> / 67.89 <sup>a</sup> / 45.25 <sup>c</sup> / 46.61 <sup>c</sup> / 67.31 <sup>a</sup>	133.31 <sup>a</sup> / 137.87 <sup>a</sup>
Red clover (RC)	<i>Trifolium pretense</i> L .	49.40 <sup>a</sup> / - / 35.55 <sup>b</sup> / - / - / -	150.84 <sup>a</sup> / 148.80 <sup>a</sup>
White clover (WC)	<i>Trifolium repens</i> L .	76.20 <sup>a</sup> / 37.73 <sup>d</sup> / 63.39 <sup>b</sup> / 48.99 <sup>c</sup> / 50.51 <sup>c</sup> / 66.53 <sup>b</sup>	157.03 <sup>a</sup> / 145.10 <sup>b</sup>

Note : - Means not be treated ; <sup>a-d</sup> means significance at 0.05 level ; ①-④ means different treatments .

**Results** Most of fresh forage seeds' digestibility were higher than aged seeds significantly ( $p < 0.05$ ) , which explained that aged seeds' digestibility decreased . Compared gramineae forage seeds with intact non-treat seeds , the variations of digestibility were insignificant by water immersion , waste liquor of amino acid immersion and germinate treat . But the digestibility of leguminosae forage seeds (alfalfa , RC and WC) were higher than intact non-treat seeds after germinate treat , it correspondence with smashed seed . Forage seeds' digestibility and gas releasing amount in digest treat had significant positive correlation ( $r = 0.9394$  ,  $p < 0.05$ ) .

**Conclusions** The forage seeds' digestibility after smashed and germinated treat could increase significantly (Kaur et al 2006) . The digestibility of aging seeds was low . So , it can consider increased the digestibility by germinate treat for feeding . Gas releasing amount in process of digest treat could be used to estimate forage seeds' digestibility .

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