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The Effect of Crude Fibre Level and Type of Roughage on the Yield and Quality of Milk and Fat with Friezian Cows

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THE STUDY was undertaken to find out the suitable crude fibre level for feeding Friezian dairy cows. The replacement effect of rice straw to wheat straw on milk production was also investigated.

Three comparative feeding experiments were undertaken with 14 Friezian lactating cows using the "swing over" method. Exp.1 (4 cows) and Exp. 2(4 cows) were conducted to study the effect of crude fibre level on the yield of milk and fat and their quality. Exp. 3 (6 cows) was to study the effect of replacing wheat straw by rice staw.

Seven mixed rations containing from 14 up to 31% crude fibre (DM basis), were directly fed to sheep in digestion trials to determine their digestibilities and feeding value before offering to lactating cows.

Results indicated that the calculated feeding value of the mixed rations from their ingredients were noticeably higher than those actually determined by direct feeding, difference being from 6 to 23%. Therefore, reliance should be on direct digestiblities of feed mixture before utilization in comparative feeding experiments.

Increasing starch in the mixed ration reduced noticeably crude fibre digestibility but increased crude protein digestibility. Replacement of rice straw to wheat straw produced practically a mixture of similar nutritive analysis, digestibilities and feeding value as that including wheat straw.

Reducing CF level from 29 to 20%, increased milk and fat yield significantly (4.41±1.08% for milk and 7.90± 1.79% for fat) but such differences could be practically neglected. Generally,the results indicated that a range of 14 to 29% CF level could be applied for feeding Friezian cows (producing less than 10 kg milk and under local conditions) without affecting practically milk and fat yield or their qualities.

Similar results were obtained with milk and fat yiled and their quality when replacing rice straw feed mixture (31.85% CF by wheat straw feed mixture (29.72% CF).

Results are of economical importance in feeding Friezian cows under local conditions. Feeding with mixtures containing relatively high roughage percentage, would reduce feeding cost. Using rice straw would also overcome the problem of wheat straw shortage and its relatively high price.

Owing to the scarcity of concentrates and their relatively high price in Egypt, it was considered very important from the economical point of view to reduce their proportion in feed mixtures particularly with lactating animals. For recommendation in feeding practice, a series of investigations should be undertaken in order to know the suitable safe level of crude fibre such mixed rations.

In the last few decades, wheat straw becomes short in quantity and relatively high in price becoming a serious problem to the farmer and experimental stations. At the same time, owing to the increase in cultivated areas with rice- a surplus of a relatively low price straw is produced. It was therefore impor, tant to study the effect of replacing wheat straw with rice straw on milk production.

Therefore, this investigation was undertaken to study the effect of relatively wider range of crude fibre in rations as well as the replacement of rice straw to wheat straw on milk and fat yield and their qualities with Friezian cows under our local conditions.

Material and Methods

Seven digestion trials using duplicates of mature rams, were carried out to determine the digestibility and feeding value of all mixtures containing different levels of crude fibre used in the feeding experiments. A ten days preliminary period was followed by 10 days collection. The methodology followed the same procedure at the Animal Nutrition Section, Animal Production Department, Faculty of Agriculture, Cairo University including sampling, analytical methods, calculating digestibilities and feeding value as SV, TDN and DP. Species differences between sheep and cows was considered negligible among ruminants.

The feedstuffs offered included the unified feed mixture UM (65% undecorticated cotton seed cake, 15% rice bran, 14% wheat bran, 2% calcium carbonate and 1% sodium chloride), wheat straw, clover hay, rice straw, decorticated cotton seed cake and a wheat bran. Maize strarch was also added mainly to lower the crude fibre content in two rations. The ingredients of used mixtures and their crude fibre level are summarised in the following table:

Constituents of the rations (as fed) %	Crude fibre % *in dry matter*
Mixture No. 1, *digestibility Trial* 1 40% feed mixture, 40% wheat straw and 20% clover hay 1.	29.72
Mixture No. 2, *Trial* 2 40% feed mixture, 40% rice straw and 20% clover hay 1.	31.85
Mixture No. 3. *Trial* 3 33. 33% of decorticated cotton seed cake, 33. 333% of wheat straw 1 and 33. 33% of wheat bran.	20.13
Mixture No. 4, *Trial* 4 2 parts of mixtures 3 with 1 part of maize starch.	14.19
Mixture No. 5, *Trial* 5 33. 33% of decorticated cotton seed cake, 33. 33% of wheat straw 2 and 33. 33% of wheat bran.	19.80
Mixture No. 6, *Trial* 6 2 parts of mixture No. 5 with 1 part maize starch.	14.22
Mixture No. 7. *Trial* 7 40% feed mixture, 40% wheat straw 2 and 20% clover hay 2.	29.56

The distribution of Friesian cows and rations on successive periods of Swing over experiments was as follows :

Expt.	Cows No.	Period (25 days)	Mixture No.
Expt. 1	1—4	Initial control	1
		Tested 1	3
		Tested 2	4
		Final control	1
Expt. 2	5—8	Initial control	5
		Tested 1	6
		Tested 2	7
		Final control	5
Expt. 3	9—14	Initial control	1
		Tested	2
		Final control	1

Three comparative feeding experiments were undertaken with fourteen Friezan cows, following "the Swing over" method already used (El-Samman *et al.*, 1969; Abou-Hussein, 1958; Crichton, 1953 and Kellner (1924). Each individual cow was fed on the same control ration at the initial and final period during the experiment and one or two tested rations in between. Non-pregnant lactating cows were chosen after the peak of their lactation.

Experiment 1 and 2 included 2 control periods and 2 tested one, while experiment three included 2 control periods and one tested. Each period of 25 days started with 10 transition days followed by 15 days for collecting milk, and preparing daily milk samples of individual cows (proportionate sample from evening and morning milk).

Composite milk sample at the middle day of each period was taken from the experimental group of cows (proportionally according to daily milk yield). It was used for preparing a suitable fat sample and for determining the nutritive analysis of the milk for total solids, ash, protein and fat as well as inorganic phosphorus calcium and lactose. Iodine-number, Reichert-Messel number, Polenesk-number and Saponification-number were determined in prepared fat using the methods of the A.O.A.C. (1970).

Maintenance requirements for dairy animals followed those recommended by Ghoneim (1967) (for each 100 kg live weight 0.58 kg SV and 50 g DP). Production requirement was calculated from the fat corrected milk (FCM) yield. Each 1 kg F. C.M. requires, 0.26 kg SV and 72g DP as recommended by Abou-Raya (1967). Table 1 qualifies the cows and presents their daily requirements at the start of each experiment. Such requirements remained the same during the whole experimental period. For each tested ration the percentage difference of milk or fat yield from that of the initial control for each cow was calculated. The average for the group was known and its significant from zero was determined from the propper "t" test.

TABLE 1. Daily feed requirements of different cows and experiments.

Cow No.	Live wight	Milk yield (before expt.)	Milk fat	Daily requirements	
				S V	D P
	kg	kg	%	kg	g
Expt. 1					
1	406	9.0	4.0	4.7	812
2	423	7.2	4.4	4.4	723
3	434	9.0	4.0	4.9	826
4	416	9.6	3.2	4.6	789
Expt. 2					
5	395	8.1	3.8	4.4	731
6	422	8.3	3.8	4.6	757
7	325	7.4	3.1	3.6	603
8	411	9.0	4.1	4.8	822
Expt. 3					
9	388	5.8	4.2	3.8	597
10	399	4.8	4.1	3.9	597
11	439	8.5	4.2	4.9	810
12	445	6.3	4.4	4.3	671
13	424	8.1	4.6	4.8	803
14	408	7.2	4.7	4.5	735

Results and Discussion

Digestibility and feeding value of the experimental rations

The feeding value of rations (Table 2 and 3) obtained biologically by sheep from direct feeding in digestion trials, ranged between 30.39 and 56.06% SV as fed (44.14 -61.45% TDN) or 2.1 - 2.98 M cal DE/kg. Such feeding value appeared suitable for dairy animals according to the N.R.C requirements, (1971), recording 60% TDN on dry matter basis for dairy animals producing less than 20 kg milk daily. In mixtures 6.4 and 5 the corresponding TDN obtained here on dry matter basis were 67.51, 63.82 and 58.0% respectively. The lowest TDN was 47.6% with ration 1. It appears that these figures would be still suitable for Friezian cows producing less than 10 kg milk under our local conditions. This was confirmed by the fact that the animals consumed the whole ration offered calculated from both maintenance and production requirements as indicated in Table 1.

TABLE 2. Nutritive analysis of feed mixtures as fed.

Item	No. of mixtures						
	1	2	3	4	5	6	7
DM	92.65	92.91	90.25	90.63	91.05	91.02	92.43
CP	13.98	14.33	16.02	13.20	15.95	13.95	13.73
EE	3.83	3.57	4.49	3.31	4.22	2.82	3.39
CF	27.54	29.60	18.17	12.86	18.29	12.94	27.33
NEE	34.87	32.59	43.84	55.82	44.90	56.04	36.49
Ash	12.43	12.82	7.73	5.44	7.70	5.25	11.50

TABLE. 3 Digestibilities of nutrients and feeding value of feed mixtures as fed.

Item	Ration No.						
	1	2	3	4	5	6	7
Digestibility %							
CP	67.35	71.36	52.57	59.44	53.15	60.90	67.24
EE	51.19	62.01	68.93	61.95	70.89	61.49	50.25
CF	43.75	42.75	38.92	14.29	38.59	21.75	43.07
NFE	54.76	53.08	63.56	78.00	68.01	82.45	57.78
Feeding value							
*DE, Mcal/kg	1.94	1.99	2.22	2.55	2.33	2.71	2.02
DP, %	9.41	10.22	8.42	7.85	8.48	8.50	9.23
TDN, %	44.10	45.14	50.30	57.84	52.78	61.45	45.90
SV (A), %	30.39	29.62	42.37	52.51	44.81	56.06	31.88
Calculated	37.5	36.5	47.4	61.8	47.7	61.8	37.4
SV (B)							
(from ingredients)%							
% difference	23.0	23.0	12.6	17.7	6.4	10.2	17.3
B from A							

* DE calculated assuming 1 kg TDN = 4.40g Mcal (Moe and Flatt, 1969).

Moreover, the crude protein % in the offered feed mixtures ranged between 14.65 (R.4)up to 17.75(R.3) on dry matter basis being higher than recommended by N.R.C. (14%). The corresponding digestible protein % was between 8.7 and 11.0. Although the lower limit of the range was lower than recommended by the N.R.C. (10.5%) yet it was suitable for low producing cows (< 10 kg milk). In all used mixtures the calculated required DCP was fulfilled by the feed consumption.

In addition, the EE content in the rations (3.12-5.0%) EE on dry matter) was suitable being more than the minimum limit recommended by the N.R.C. (2%).

Concerning the CF in the used rations it ranged between 12.68 and 29.6% as fed (14.56-31.85% on dry matter basis). This level of CF was in all cases higher than the limit of 14.% recommended by N.R.C. for lactating cows.

It was observed that when R.3 was mixed with maize starch (2:1) the CF digestibility was reduced from 39% to 14%. This was attributed to the effect of the rumen microflora which prefered to take their energy requirements from starch rather than from CF containing hardly digested celluiose. At the same time the digestibility of the CP in R.3 was lower than in R.4 in spite of the fact that the CP % in R. 3 was higher than that in R.4 (16.02 against 13.2% as fed). It seems that enrichment of R.3 by starch addition as in R.4 would increase the rumen flora resulting in more utilization of nitrogenous constituents in the feed. The same was observed with CF and CP digestibilities when starch was added to R.5 to form R.6.

It was also interesting to notice that the amount of "ballast " as indigestible CF in the ration / 100 g intake (as fed) was 11.08, 11.02, 11.23 and 10.13% with ration, 3,4,5 and 6 respectively. Reduction in CF digestibiliy with ration 4 and 6 appeared to restore the level of the ballast in the mixture to remain as that in ration 3 and 5.

From the practical point of view R. 1and2 (When replacing the common roughage of wheat straw by rice straw) had practically the same nutritive analysis with a negligible increase in CF % (from 27.54 to 29.60 as fed). Moreover, both rations had practically similar digestibility coefficients with all ingredients as well as similar feeding value. Ration 2 had a slightly higher DCP % being in favour of rice straw.

Testing the reliability of calculated feeding value of mixed rations from the feeding value of their ingredients

In ordinary practical feeding, it is usual to calculate the feeding value of prepared rations from the recorded figures of their separate ingredients from previous digestibility trial data, such as recorded by Abou-Raya (1967). The

calculated figures for the seven rations used here (Table 3) deviated from those actually obtained from digestion trials. The calculated value was 23% more in ration 1 and 2 and 17.5% more in ration 4 and 7 and about 12% more with ration 3 and 6. In one case with R. 5 the calculated figure was only about 6% more. Therefore, calculated figures would lead to unreliable results in compa rative feeding studied. The feeding value of feed mixture should be obtained by direct feeding in digestion tral. This would avodir the associated effe ct when mixing feeds. With rations used here, the associated effect appeared to be negative lowering the feeding value obtained from the digestion trials. This observations and conclusions wer indicated by Abou-El-Hassan, *et al.* (1974) with mixed rations fed to growing Friezian calves. The calculated SV from ingredients of the consumed feed mixtures (including barely straw, clover day and concentrate mixture) was 19% lower than that determined indicating mostly a positive mutual associative effect. This was also found with mixed poultry feed for growing chicks (Abou-Raya *et al.*, 1974), the associative effect being negative.

The effect of CF level on the yield and quality of milk and its fat with Friezian cows

Results in Table 4 indicated that reducing the percentage of CF level in tested R. 1 (Expt.1) from 29.72% down to 20.13% (DM basis) increased significantly the milk yield by 4.41 $\pm$1.08% (4.92, 4.75, 6.57 and 1.41 with individual cows). With fat yield this also caused a significant increase of 7.90 $\pm$ 1.79 (7.92, 12.85, 6.34 and 4.49 with individual cows). But in the same experiment reduction of the CF further to 14.19% caused an insignificant decrease of 2.77 $\pm$ 1.89 in milk yield and 5.24 $\pm$ 2.18 in fat yield.

In Expt. 2 when reversing the succession of CF level from 19.80 to 29.56, a noticeable increase occurred in both milk and fat yield (for milk 14.45 $\pm$ 8.44 and 27.45 $\pm$ 9.32 for fat) but it was insignificant. This was in a way an opposite trend to results in Expt. 1. Slight reduction in CF level from 19.80 to 14.22 caused a slight and insignificant decrease in yield (0.97 $\pm$ 5.34 for milk and 4.38 $\pm$ 3.73 % for fat).

It appears that there is an optimum level of CF in dairy rations which is about 20%. A slight decrease in milk and fat yield might occur by raising the CF up to 29% or decreasing it down to 14% as found here and confirmed by the works of Brown *et al.* (1963) and Castle *et al.* (1963). But others (Henke and Maruyama, 1947; Nordfeldt *et al.*, 1950; Elliot and Loosli, 1959; Abou-Hussein, 1958 and Darwish, 1963) recorded that raising the level of CF to about 22% introduced a reduction in milk and fat yield.

It seems that conflicting results might be due to other factors such as the type of ration used and or the level of milk yield of experimental animals. Some feeds might have a reducing effect on milk yield in spite of their CF level. High milk yielders appear to be more sensitive to high CF level which might

not allow the animals for the proper feed intake. In our study, the local Friezian cows used were relatively low yielders . This may explain the fact that they were not practically affected by raising the level of CF. The increase in milk yield in Expt. 1 did not exceed 4% when reducing CF level from 29 to 20%. Such difference could be practically neglected. This means that in practice under our local conditions, the increase of CF level when feeding low producing animals would enable using cheapers feed mixtures containing relatively lower / ount of concentrates.

TABLE 4. The effect of CF level on the yield of milk and milk fat with Friezian cows.

Item	(1) Expt. 1		(2) Expt. 2	
	Milk yield	Fat yield	Milk yield	Fat yield
Average milk yield[3]	kg	kg	kg	kg
a) Init. Control at 18*th* day	7.56	0.296	7.07	0.285
b) *Ist* test at 43*rd* day	7.26	0.305	6.90	0.269
d) 2 *nd* test at 68*th* day.	6.08	0.251	7.92	0.354
f) Final control at 93*rd* day.	5.68	0.252	6.98	0.279
Calculated g) Daily decrease. (a—f) = g (93—18)	0.0254	0.0006	0.0009	0.0008
c) Yield at 18 *th* day (b+g (43—18)	7.89	0.319	6.92	0.271
% difference $\frac{c-a}{a} \times 100$	+4.41±1.08	+7.90±1.79	—0..97±5.34	—4.38±3.73
Calculated "t"	4.08	4.41	0.18	1.17
e) Yield at 18 *th* day (b+g (68—18))	7.35	0.280	7.96	0.358
% difference $\frac{e-a}{a} \times 100$	—2.77±1.89	—5.24±2.18	+14.45±8.44	+27.45±9.32
Calculated "t"	1.47	2.40	1.71	2.95

1. Crude fibre % being 29. 72, 20. 13 and 14.19 for control, tested and tested 2 resp.
2. Crud fibre% being 19.80, 14.22 and 29.56 for respective periods.
3. Average of 15 days for 4 cows representing the middle day of collection period.

Results in Table 5 and 6 concerning milk composition and fat quality in Expt. 1 and 2 indicated generally that the CF level appeared not to affect such parameters. Slight increase in the majority of milk nutrients was rather due to the natural increase in percentage composition particularly in fat and protein content by the advancement in lactation. This is usually associated with gradual reduction in milk yield and slight increase in the percentages of milk nutrients.

TABLE 5. The effect of CF level and type of roughage on milk nutrients with Friezian cows.

Moisture fat protein Period %	Ash %	Other nutrients g/100 ml		
		Calcium	Inorganic phosphorus	Lactose
Expt. 1				
Control (R.1, 29, 29.72% CF): 88.53 3.92 2.95	0.87	0.773	0.311	577
Tested 1 (*R.*3, 20. 13% *CF*): 88.37 4.22 2..71	0.78	0.099	0.342	5.3
Tested 2 (*R.*4, 14. 19% *CF*): 87.36 4.15 3.34	0.69	0.118	0.362	4.4
Control (*R.*1, 29.72%. *CF.*as. fed) : 88.37 4.66 2.88	0.62	0.0666	0.291	5.8
Expt. 2				
Control (*R.*5.19.80% *CF*): 88.55 4.01 2.76	0.62	0.096	0.311	5.6
Tested 1 (*R.*6. 14.22% *CF*) : 88.74 3.92 3.15	0.85	0.115	0.307	4.5
Tested 2 (*R.*7. 29.56 *CF*): 90.41 4.43 2.92	0.66	0.082	0.295	5.9
Control (*R.*5. 19.80% *CF*): 81.82 4.00 2.95	0.70	0.098	0.303	5.5
Expt. 3				
Control (*R.*1, 29.72% *CF*): 89.03 4.44 2.89	0.66	0.075	0.292	5.6
Tested (*R.*2, 31.85% *CF*): 88.66 4.55 3.61	0.68	0.066	0.326	5.9
Control (*R.*1, 29.72% *CF*): 88.19 4.63 2.85	0.69	0.085	0.319	5.8

(*) DM basis.

TABLE 6. **The effect of CF level and type of roughage on the quality of milk fat with Friezian cows.**

Period	Iodinenumber	Reichert-meissel number	Poleneske-number	Saponi-fication number
Exp. 1.				
Control (R.1, 29.72% CF):	37.13	23.50	2.40	230
Tested 1 (R.3, 20.13%Cf):	39.61	21.80	2.60	220
Tested 2 (R.4, 14.19%CF):	40.67	19.90	2.90	209
Control (R.1, 29.72%CF):	36.14	22.30	2.30	237
Expt. 2				
Control (R.5, 19.80%CF):	37.99	23.10	2.50	225
Tested 1(R. 6, 14.22%CF):	39.98	21.30	2.70	216
Tested 2 (R.7, 29.56 CF) :	34.18	24.30	2.30	248
Control (R.5, 19.80%CF):	36.92	23.40	2.60	230
Expt. 3.				
Control (R.1, 29.72% CF):	39.98	21.30	2.70	216
Tested (R.2, 31.85% CF):	34.18	24.30	2.30	248
Control (R.1, 29.72%CF):	36.92	23.40	2.60	230

The effect of type of roughage on the yield and quality of milk and fat with Friezian cows

In Expt. 3 (Table 7) replacement of wheat straw by rice straw, although slightly increase both milk yield (2.13 1.11) and fat yield (3.97±1.71) yet the change was indignificant and negligible. This was expected because the two mixed ration 1 and 2 were practically of the same nutrient composition, digestibilities and feeding value. Moreover, the replacement have no noticeable effect on milk composition and fat qualities (Table 5 and 6). Under our conditions, digestibility trials with wheat and rice straw indicated their similarity in feeding value (about 24-25% SV, Abou Raya, 1967). This would encourage to use rice straw instead of wheat straw for feeding dairy animals whenever possible. This would overcome the problem of wheat

straw shortage beside reducing the feeding cost. In this connection El-Samman *et al.* (1969) succeeded in introducing up to 4 kg rice straw in feed mixtures for lactating buffaloes with or without molosses addition.

TABLE 7. **The effect of type of roughage on the yield of milk and milk fat with Frierian cows.**

Item	Expt. 3	
	Milk yield	Fat yield
Average milk yield	kg.	kg.
a) Init. control at 18th eday[2]	6.09	0.269
b) Tested at 43rd day[3]	5.87	0.267
f) Final control at 68 the day	5.35	.245
Calcula ed (a—f)		
g) Daily decrease $\frac{(68\text{-}18)}{} = g$	0.0146	0.0005
c) Yield at 18 *h* (day) b + g	6.21	0.279
(43— 18)%difference $\frac{(c-a)}{a} \times 100$	2.13±1.11	+3.97±1.71
Calculated "t"	2.1	2.3

1. Average of 15 days for 6 cows, representing the middle day of collection period.
2. Wheat straw mixture (29.72% CF).
3. Rice straw mixture (31.85 % CF).

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تأثير مستوى الألياف الخام ونوع العلف الخشن على محصول اللبن والدهن وخواصهما مع البقر الفريزيان

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أجريت هذه الدراسة لمعرفة أنسب مستوى من الالياف الخام فى علائق ماشية اللبن الفريزيان وكذلك تأثير احلال قش الارز محل تبن القمح فى العلائق لأنتاج اللبن تحت الظروف المحلية ..

ولقد أجريت ثلاث تجارب تغذية مقارنة مع ١٤ بقرة باستخدام طريقة عود الى بدء . الاولى (٤ بقرات) والثانية (٤ بقرات) لدراسة تأثير مستوى الألياف على محصول اللبن والدهن وخواصهما والثالثة (٦ بقرات) لدراسة تأثير احلال قش الارز محل تبن القمح .

واستخدم سبع مخاليط من الاعلاف تتراوح نسبة الألياف فيها من ١٤الى ٣١٪ وأجريت عليها تجارب هضم مع الغنم بالتغذية المباشرة لايجاد معاملات الهضم والقيمة الغذائية لها قبل تقديمها للابقار فى تجارب التغذية المقارنة .

ولقد أوضحت النتائج أن القيم الغذائية المحسوبة لهذه المخاليط من مكوناتها أعلى بمقدار من ٦ الى ٢٣٪ من تلك التى نتجت من تجارب الهضم مما يؤكد ضرورة الاعتماد على معاملات الهضم بالتغذية المباشرة للمخاليط قبل اجراء تجارب التغذية المقارنة ـ كما أوضحت النتائج أن زيادة المنشأ فى مخاليط العلف أدى الى انخفاض ملحوظ فى هضم الألياف ، وزيادة فى هضم البروتين الخام . وان احلال قش الارز محل تبن القمح كون مخلوطا له تحليل غذائى ومعاملات هضم وقيمة غذائية كتلك التى للمخلوط الذى يحتوى على تبن القمح .

وقد أدى تخفيض نسبة الالياف من ٢٩ الى ٢٠٪ الى زيادة معنوية فىمحصول اللبن والدهن (٤١ر٤ ١ر٠٨٪ للبن و ٧ر٩٠ + ١ر٧٩٪ للدهن) ولكن يمكن أهمال هذا الفرق من الناحية العملية عموما قد أوضحت النتائج أنه يمكن استخدام علائق بها نسبة الياف من ١٤ الى ٢٩٪ مع الابقار الفريزيان التى تنتج أقل من ١٠ كجم لبن يوميا وتحت ظروفنا المحلية دون تأثير ملموس على محصول اللبن والدهن وخواصهما . وقد تم الحصول على نتائج مماثلة عند احلال قش الارز (٣١٪ البان) محل تبن القمح (٢٩٪ الياف) .

ولهذه النتائج قيمة من الناحية الاقتصادية عند تغذية الابقار الفريزيان تحت الظروف المحلية ، فاستخدام مخاليط عالية الألياف تسببا يوفر من المواد المرسمزة وتكاليف التغذية ، كما ان ادخال قش الارز فى العلائق يخفض التكلفة ويسهم فى حل مشكلة نقص تبن القمح المرتفع السعر ..