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A New Pelleted Feed Mixture Composed Mainly of Maize Stalks

I. Digestibility and fattening experiments with steers

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Several trials were undertaken to prepare a feed mixture containing mainly enriched and milled maize stalks, undecort. cotton seed cakes, molasses and other aditives forming a suitable mixture adaptable for pelleting at local plants. Certain proportions proved successful with a suitable pelleting rate, palatable to sheep and steers, having a suitable texture and density being readly consumed without milling and without any symptoms of abnormality or disorders.

Digestibilites with sheep were 62.29, 70.15, 55.76 and 57.71% for CP, E E, CF and NFE respectively. The feeding value was 40.42% SV and 48.72% TDN. The DP was 9.79% with NR (I : 3 : 0). Retention of N was 62.34 % (apparent retention from digestible, N) leading to a high biological value of the protein (76.66%).

Comparative feeding trials for fattening sters, individually fed indicated that the feed mixture produced the same results when partially or totally replaced by the equivalent amounts of unified mixture. During 8 week period, the 5 steers of the tested group increased in weight from 259.2 ± 13.9 kg to 294.3 ± 11.08. The corresponding values with control group were 255.9 ± 7.33, 290.0 ± 7.79. without any significant differences with the initial, the final live-weignt and the gain. During the finishing period (2 weeks) the initial and final weight were 292.6 and 307.5 respectively with the tested group, while they were 295.6, 310.6 kg with the control one with-out any significant difference. The average daily gain during the first 8 weeks was 0.626 and 0.609 in group I and II; with individual animals the highest gain was 0.812 kg in G I and 0.732 kg in G.2. During tje finishing period (2 weeks), the average daily gain was 1.06 kg and 1.07 kg indicating that introducing maize grains improves the daily gain.

In recent years, there is a general trend to make full use of agricultural residues particularly for feeding animals. They are treated chemically, biologically and /or mechanically to increase their feeding value and to reduce their bulkiness. Addition of suitable feed additives, for enriching and seeking, for a better balance of nutrients, is practicised. Particular efforts

were directed to nonproteinous nitrogenous additives, leading to practical applications of urea under specified conditions which ensure the safety and better utilisation of urea N. In this Departments, efforts have been directed to use urea and/or molasses to enrich roughages for sparing some of the dear concentrates used in feeding dairy animals (El-Serefy, 1968) and Sheep (El-Shinnaway, 1970). The mixtures used were not adopted for commercial application and easy distribution among farmers and co-operative societies under our practices. Careful study of the available feeds including grains, concentrated by-products as well as customarily used roughages, indicated a real feed-shortage and bad distribution all the year round. The limiting factor of preparing the authorised unified feed mixture (usually 65% undecorticated cotton-seed cake, 20% rise bran, 9% wheat bran, 3% molasses, 1% common salt, 2% calcium carbonate) is the amount of available rice bran, leaving ca. 300,000 tons of free undecorticated cottonsseed cake. The prepared feed mixture fluctuated annually between 250,000 to 300,000 tons being far beyond the capacity of new plants installed according to the present five-year plan for preparting feed mixtures using extracted undecorticated cotton seed cakes. In addition, a serious problem meantime is faced by the farmers to find available roughages for their ruminatnt animals.

Moreover, ca. 120, 000 tons of molasses are produced, having cheaper price than other carbohydrated feeds. Surplus molasses, instead of being exported at a low price, could be more economically used for feeding animals. Although urea is still produced on a small scale in AR Egypt, yet ample amounts are imported for use as a manure. Enriching roughages with both urea and molasses would raise its feeding value sparing some of the concentrated feeds. Pelleting such supplemented roughages along with concentrates would provide more balanced feeds avoiding adultration and rendering the roughage to occupy smaller size being more adoptable for packing and transporting.

This study was undertaken to prepare a suitable feed-mixture using some of the free-cotton seed cake, and a suitable available roughage of maize stalks enriched with certain additives particularly molasses and urea. Such feed-mixture would make possible the utilisation of a roughage wastefully used, increasing the availlable feeds as well as the capacity of plants producing prepared feeds. This participates particularly in solving the problem of feed shortage in A.R.E. Three authorities co-operating in this work providing facilities, were the Faculty of Agric. Cairo University, the Development Consultant Association, A.R.E. and the "Feed Manufacturing Plants at Alexandria and Zinnarah (Monoufia Governate).

Experimental and Methods

Feed manufacturing plant

Two of the common plants were used at Alexandria and Zinnarah (Monoufia Governate), having a production capacity of 100 and 50 tons/day. Five operations were succeedingly undertaken, milling row material, mixing and homogenizing, mixing molasses, pelletting and cooling and finally packing.

Milling maize stalks

At Alexandria plant, it was milled using 3 mm. mesh, but milling rate was slow (300 kg/hr). At Zinnarah, coarse milling was done first using a small portable threshing machine of the co-operative Society near-by, then finely ground at the plant to pass 4 mm seive.

Mixing the feed ingredients

With small lots, hand mixing was used, but mechanical mixers were used with big lots.

Manufacturing trials with different mixtures

1. Trials with maize stalk alone along with molasses and some additives, on a small scale (50-100 kg) were done by passing the mixture through the molaasses mixing set to the mechanical mixer then to the pelleting set (Alexandria plant).

2. Trials with maize stalks along with undecroticated cottonseed cakes with or without rice bran but along with certain additives including urea common salt and calcium carbonate, were tried at first on a small scale. A big lot of 1.5 tons was prepared passing through the whole manufacturing steps (Alexandria plant). Urea N did not exceed 30% of total N.

3. Trials at zinnarch were with 6 mixtures (500-750 kg) containing mainly maize stalks, undecorticated cottonseed cake on similar lines as those already prepared at Alexandria. A part of the cake was replaced by small amounts of rice bran or wheat bran in two mixtures. In all cases, the proportions of the ingredients in the mixture was intended so that to ensure very approximately similar nutiritive composition and feeding value as calculated from separate ingredients.

Official samples from the six mixtures were sent to the Ministry of Agriculture for analysis of crude protein and crude fibre.

The six mixtures were mixed together to amount to 3.5 tons. The average ingredients composition of this lot (PM) was 39.1 maize stalks, 28.0 undecorticated cottonseed cake unextracted, 11.7 wheat bran, 3.5 coarse wheat bran , 8.9 molasses, 1.5 urea, 1.0 common salt., 1.0 calcium caronate and 0.4% Oil.

Digestibility and Nbalance studies

With the chosen pelleted mixture, (PM) a digestion trial with 4 mature rams (40-50 Kg) was conducted. Pellets at a rate of 1.5 kg was given without milling for 10 days preliminary period and 10 days collection. Composite samples were prepared from urine and faeces which were preliminary dried at 60. C. Faecal secondary moisture was determined at 105. C for 3 hrs. For calculating the starch value (SV), the crude fibre deduction of 0.30 SV per unit crude fibre was applied. For calculating the biological value of protein, metabolic faecal N was considered 0.5 g/100 g dry matter intake. Endogenous urinary nitrogen was taken as 0.093 g/1 kg metabolic body size (w 0.75).

Comparative feeding experiments with prepared pelleted mixtures (PM) versus the unified feed mixture (UM).

Ten steers purchased from local markets were put into experiment on the 2nd. of August, 1970 at Sirce-Ellayan Animal Production Station (Monoufia Governate). They were devided into two groups of 5 animals randomly distributed, Group 1 (Animal no. 1 to 5) and Group 2 (Animal 6 to 10) having an average weight of 233.4 ± 12.09 and 227.6 ± 7.3 kg respectively without significant difference between their average live weight.

The two groups were individually fed for 5 weeks as a transition period on the same amount of UM and wheat straw to ensure that both groups continue to have statistically the same average live wieght and gain to avoid inherited differences. The corresponding weights were 259.2 ± 13.2 and 255.9 ± 7.33 kg. Then gradual replacement of PM in Group 1 for UM in Group 2 continued for 5 weeks when complete replacement started and continued for another 3 weeks. Each 4 kg from PM was considered to equal 3 kg from UM. Feeding was according to the following :

Week	Group 1				Group 2			Offered SV Kg
	UM	PM	Straw	Maize	UM	Straw	Maize	
1	4	—	4	—	4	4	—	3.2
2	5	—	4	—	5	4	—	3.75
3	5	—	4	—	5	4	—	3.75
4	5	—	4	—	5	4	—	3.75
5	5	—	4	—	5	4	—	3.75
6	4.5	2	4	—	6	4	—	4.30
7	3	4	4	—	6	4	—	4.30
8	3	4	4	—	6	4	—	4.30
9	3.5	5	2	—	7	2	—	4.35
10	3.5	5	2	—	7	2	—	4.35
11	2	7	2	—	7	2	—	4.35
12	—	10	2	—	7.5	2.2	—	4.60
13	—	10	2	—	7.5	2	—	4.60
14	—	12	2	—	9	2	—	5.50
15	—	8	1	1	6	1	1	4.4
16	—	8	1	1	6	1	1	4.4

Animals were weekly weighed at 8 AM before the morning meal in two successive days and averaged to the nearest 0.5 kg.

Methods of analysis

Conventional methods of the A.O.A.C., (1955), were used for moisture, crude protein (CP), urea N, crude fibre (CF), ether extract (E.E.) and ash. Nitrogen-free extractives (N-FE) were known by difference.

Results and Discussion

Pelleting experiments

The preliminary trials with milled maize stalks along with molasses and additives proved to be unsuccessful for pelleting. The product was loose passing slow through the pelleting set. This idea was discarded unless being used to form loose feed mixtures. The mixtures would have the benifit of being enriched and more palatable but have the disadvantage of being bulley costing a lot to transports and being succeptible to adultration.

In the second series of trials using a suitable amount of undecorticated cotton seed-cakes along with maize stalks, with or without rice bran, proved to be successfully pelleted when molasses was 11%. This urged to prepare it at a semiindustrial scale passing through the whole operation. But it was observed that the role of pelleting was not up to the standard. Choacking occurred through the channels and hoppers probably because the stalks were not idealy milled. The feeding value of this mixture was determined in digestion trials with sheep.

During the third trial at Zinnarah, the maize stalks were better milled. The six trials were successfully pelleted at a sutiable rate using molasses, maize stallks and undecorticated cotton seed cakes at a certain suitable level. Addition of 3% rice seed oil in a mixture was not benificial for peelleting. Applying steam was not neacessary after regulating the passage of the mixture to the set. Table 1 includes the nutritional analyses of these six misxtures. The pellets formed were of a good quality being neither too hard to need milling before offereing to animals nor too loose to become mealy. In fact, the mixture was offered to steers without milling as they were able to deal with it.

TABLE 1. **Nutritive analyses of prepared feed mixtures at Zinnarah plant.**

No. of sample	1	2	3	4	5	6
Analyses (air dried),%						
Moisture	8.55	8.54	8.29	8.32	7.91	8.61
Ash	11.04	12.20	11.33	11.71	13.62	12.50
Crude protein	16.05	13.94	17.16	17.99	17.89	15.18
Ether extract (crude fat)	3.90	4.18	4.30	4.05	2.96	6.05
Crude fibre	25.55	71.36	22.38	23.04	27.79	27.05
N-free extractives	34.91	39.78	39.57	34.89	39.83	30.61

The official analyses for crude protein and crude fibre undertaken by the Ministry of Agric. were as follows

No. of sample	1	2	3	4	5	6
Crude protein %	16.54	14.26	17.63	18.25	18.20	15.75
Crude fibre %	25.62	21.30	22.45	23.02	27.88	26.14

It was clear that the official analyses were practically concurrent with results here. It was clear that crude protein reached 18% in sample 4. Crude fibre was less than 23% in some samples and not exceeding 28%. This was within the range of crude fibre in extracted undecorticated cottonseed cakes.

It was clear that enriching milled maize stalks and its addition to cotton seed cakes formulated a feed mixture adoptable to pelleting in plants under our local conditions. If the feeding value of the mixture proved suitable when tested in digestion trials, such mixture could be prepared to replace a big part of the unified feed mixture and at the same time would increaset he amount of available feeding-stuffs by using a wastefully used roughages.

Moreover, pelleting the prepared mixture (PM) turned its density to that comparable with the unified feed mixture (UM), so that for packing, the same 50 kg sacks of the latter (UM) might be packed with the same respective weight using the former mixture (PM). Moreover, the predicted feeding value of the prepared mixture by calculation was ca. 40% starch value being about three-quarters that of undecorticated cottonseed cakes (unextracted) and eight-ninth that of the extracted undecorticated cottonseed cakes.

Digestibility, feeding value and N-retention in prepared pelleted mixture

Results indicate that sheep eat reddily the pellets without milling up to to a level of 1.5 kg which could be considered a suitable dry matter intake. No abnormal physiological symptoms were observed with the four sheep or losses in weight. Faecal material was found to have a suitable texture without any slacking or constipation symptoms.

The following composition and digestibility of nutrient were found to be as follows

Nutrient	Moisture	Ash	CP	EE	CF	NFE
Composition %	10.82	11.71	15.71	3.78	25.25	32.73
Digestibility %	—	—	62.29	70.15	55.75	57.71
Digsitble nutrients % . . .			9.79	2.66	14.10	18.90

This indicates that all nutrients were moderately or highly digested (over 55%). The digestible protein was ca. 10% . The calculated TDN and SV were 48.72 and 40.42% beig very approximately three-quatters that of undecorticated cotton seed cakes (55%SV) and ca. nine -tenth that of the extracted undecorticated cotonseed-cakes (45% SV). The nutritive ratio was found to be 1 : 3.00 being suitable for different types of production as growth and milk production. The digestible protein was ca. two-thirds that of the undecorticated cottonseed cakes being more adjustible for production without losses in protein as the case with the cakes when fed as the sole concentrate.

This encourages the conclusion that the prepared mixture could replace good quality unified feed mixture, or undecorted cotton seed cakes (unextracted).. 4 kg from the latter being equivalent to 3 kg from the formers having 55% SV. It was also predicted that the prepared mixtures could be fed alone, along with moderate quantities of roughages and/or concentrates according to the type of production. This means that the prepared mixture in practical feeding would save both the dear customarily used roughages mainly wheat or barley straw as well as saving a part of the dear and scarce concentrates. In other words, introducing the maize stalks to prepare the mixture could double the starch value available in the 300 000 tons of the free cake, raising the available 150000 tons starch value of the cakes to ca. 300 000 tons. This extra amount of 150000 tons SV could be used over maintenance level of dairy animals to produce 600 000 tons of fat corrected milk (assuming that 1 kg fat corrected milk needs 0.25 kg SV).

Moreover, the crude protein utilisation in the mixture ranked well. The percentage of apparently retained N (N-balance) was 62.34 % from apparently digested protein. The true digestibility of the crude protein was 80.08% leading also to a suitable biological value (B.V.) 76.66% (percentage of truly retained N from truly digested N) . This is cnsidered a sutiable B.V. for a mature sheep being comparable with the results obtained by Abd-El-Motagally (Miss), (1966) for hay and hay : common concentrate mixtures.

Comparative feeding studies with fattening steers

It was mentioned in the experimental that there was no significant difference in weight of the tested group (G.1) and that of the control group (G.2) either at the start of the experiment or at the end of the 5 weeks transition period when both groups were fed on the same ration (calculated "t" being 0.299 and 0.218 respectively (Table 2).

For the sake of safety when introducting a new feed mixture, the PM in the tested group replaced the UM in the control one gradually, 25% replacement for a week, then 50% replacement in the proceeding four weeks and 75% in the following week. Complete replacement started at the 11*th* week to continue up to the end at the 16 *th* week. Animals ate the PM without milling showing no sign of physiological disturbance, faecal material being of suitable texture without any symptoms of slacking or constipation.

TABLE 2. **Comparative feeding experiment with fattening steers for the replacemebt to prepared feed mixture (PM) to the "unified feed mixture" (Starting 2-8-1970)**

No. of Weeks	Average weights of		No. of weeks	Average weights of	
	animals in group 1 (tested)	Abimals in group 2 (control)		Animajs in group 1 (tested)	Animals in group 2 (control)
	kg	kg		kg	kg
0	233.4±12.09	237.6± 7.3	8	274.7	271.0
1	234.1	239.8	9	277.0	279.1
2	237.5	240.7	10	279.1	279.4
3	248.8	249.1	11	293.5	283.8
4	251.8	251.7	12	293.1	287.5
5	259.2±13.2	255.9± 7.33	13	294.3±11.08	290.0±7.79
6	265.9	261.3	14	292.6	295.6
7	207.7	268.1	15	307.5+10.58	310.6±7.41

When animals were given 10 kg at the 11*th* week as the sole concentrate, they ate it readily without leaving residues. But when given at a rate of 12 kg at the 13 *th* week (along with 2 kg wheat straw) with the tested group an average of ca. 2.5 kg (mixed feeds) per animal per day were refused diminishing the daily intake resulting in a slight reduction in weight. On the other hand, the control group given 9 kg UM (plus 2 kg straw), refused only 1.2 kg per animal per day mostly from the straw. This gave a chance to the control animals to have more intake of starch value. This was the reason why the control group continued to put on weight. At the last two weeks, before selling the animals, a finishing ration was given to both groups introducing 1 kg maize grains along with 1 kg straw beside 8 kg from PM to Gr. 1 and 6kg from UM to Gr. 2. The animals in both groups consumed their rations without leaving any residue.

This indicates clearly that the high limit of offering the prepared mixture to animals showed to be restricted somewhat owing to the relatively higher 'ballast' (indigestible nutrients) in it than the UM or undecorticated cotto-nseed cake. This was expected and was confirmed experimentally.

The replacement effect during the progressive periods from the 5*th* week up to the 15 *th* weeks was investigated. The difference in the average live-weight of the two groups at the 13 *th* week (294.3±11.08 and 290±7.79 kg in G.1 and G.2 respectively) was highly insignificant, the calculated 't' being

0.317. During this period which lasted for 65 days (*5th* to 13 *th* week), the respective gains were 35.1 ± 4.26 and 34.1 ± 2.28 kg, the difference was statistically highly insignificant (t = 0.207). The corresponding average daily gian was 0.626 and 0.609 kg.

As the animals were fed individually, it was clear that the slow growing animal was not an indicative of the efficiency of the feed but was due to inherited factors in the animal itself. With the tested group while the slowest animal put weight at a rate of 0.437 kg daily, the quickest one put almost double this amount (0.812 kg daily). The corresponding values of the control group were 0.509 and 0.732 kg daily. This indicated clearly that the replacement of UM with that of PM did not prevent the animal having the ability to put weight from performing well. The quickest animal in G.1 increased at a higher rate than that in G.2, which night be in favour of the replacement or might be due to chance.

The overall conclusion drawn from the results, was that within the conditions of the experiment, it was possible to have practically the same gain when feeding with the UM or PM either with partial or complete replacement durring the experimental period. This can be seen by comparison of the average liveweight in the two groups during the successive periods from 6 : 13 weeks (Table 2).

Moreover, discarding the results of the 14*th* week when animals in both groups left high amounts of residues, the results during the last two weeks of the finishing, indicated that animals in G.1 increased their weight from 292.6 to 307.5 ± 10.58 kg gaining 14.9 kg ± 2.37 kg while in G.2 the increase was from 295.6 to 310.6 ± 7.41 kg gaining 15.0 ± 2.68 kg. This indicates clearly that complete replacement of UM with PM produced practically the same results during the finishing period without significant differences either in the final liveweight or gain during this period. The average daily gain was improved to become 1.06 kg with G.1 and 1.07 kg with G.2. Addition of maize grain to replace a part of the UM or PM appeared to improve liveweight gain in both control and tested groups.

From the previous results, it was clear that pelleted feed mixtures could be successfuly prepared under the conditions of local manufacturing feed plants making use of cheap roughages and other additives, increasing the available feed untis. This would increase also the production capacity of such plants, transforming the roughages into a more platable form, having more condensed texture and higher feeding value. Such roughage : concentrate mixture containing a high proportion of a cheap roughage, has the benefit of having a moderate price and could be used to replace a part of the roughages and the concentrated feeds particularly for ruminant animals. This would participate in solving the problem of feed shortage for farm animals and indirectly increasing animal products for human consumption.

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علف جديد على صورة مكعبات يتكون أساسا من حطب الأذرة

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أجريت عدة تجارب لتحضير مخلوط علف يحتوى أساسا على حطب الأذرة المطحون والمضاف اليه مواد لرفع قيمته الغذائية مع كسب القطن الغير مقشور والمولاس واضافات أخرى لتكوين مخلوط مناسب يمكن تكعيبه فى مصانع العلف الحالية التى تستخدم فى تجهيز العلف الموحد تحت اشراف وزارة الزراعة .

وقد أمكن التوصل لتكوين مخاليط تتناسب مكوناتها بحيث يمكن تكعيبها بسرعة ملائمة مصنعيها .وقد وجد أن مكعبات المخاليط مستساغة للغنم والثيران ولها قوام وكثافة غذائية مناسبة وامكن للحيوان تناولها بدون الحاجة لاعادة طحنها ولم يظهر بعد التغذية عليها أى أعراض غير طبيعية أو اضطرابات .

وقد ظهر من تجربة الهضم على الغنم أن معامل الهضم للمركبات الغذائية كان ٢٩و٦٢ ،١٥و٧٠ ،٧٥و٨٥ ،٧١و٤٧٪ للبروتين الخام والدهن الخام والالياف الخام والمستخلص خالى الازوت على الترتيب منتجا قيمة غذائية هى ٤٢و٤٠٪ معادل نشا ، ٧٢و٤٨٪ مركبات مهضومة كلية وكانت نسبة البروتين المهضوم ٧٩ر٩٪ بنسبة زلالية ١ : ٤ تناسب الانتاجات المختلفة وقد كان احتجاز الأزوت مناسبا (٣٤ر٦٢٪ على حالة احتجاز ظاهرى من الأزوت المهضوم ظاهريا) منتجا قيمة حيوية مناسبة للبروتين بلغت ٦٦ر٧٦٪ ويمكن اعتبار المخلوط كمادة علف لها طاقة غذائية معتدلة ولها قيمة غذائية تبلغ ثلاثة أرباع القيمة الغذائية لكل من كسب القطن غير المقشور (غير المستخلص) ومخلوط العلف الموحد .

وقد أظهرت نتائج التغذية المقارنة على عجول التسمين المغذاه فرديا أن المخلوط أعطى نتائج متماثلة من الناحية العملية لمخلوط العلف الموحد سواء كان ذلك بالاحلال الجزئى أو الكلى .

وخلال فترة تجريبية لمدة ثمانية اسابيع زاد متوسط وزن الخمس عجول المغذاة على المخلوط الجديد من ٢و٢٥٩ ± ٢و١٣ كجم الى ٣و٢٩٤ ± ٦٦و١١ كجم مكتسبة وزنا قدره ١و٣٥ ± ٢٦و٤ كجم يقابل ذلك فى مجموعةحيوانات المقارنة ٩و٢٥٥ ± ٣٣و٧ ،٠و٢١٠ ± ٧٩و٧ ،٤و٠٣٤ ± ٦٤و٢ دون وجود فرق معنوى فى الوزن فىأول الفترة أو فى آخرها أو فى الوزن المكتسب . وفى فترة التسمين النهائى لمدة اسبوعين كان متوسط الوزن فى البداية٦و٢٩٢ وفى النهاية ٥و٣٠٧ منتجا وزنا مكتسبا قدره ٩و١٤ ± ٢و٣٧ كجم بينما مجموعة المقارنة كانت ارقامها المقابلة هى ٦و٢٩٥ ،٦و٢١٠ ، ـو١٥ ± ٢و٦٨ كجم بدون أيضا أى فرق معنوى بين المجموعتين وقد كان متوسط الزيادة اليومية فى الفترة الاولى (٨ أسابيع) ٦٢٦و٠ كجم فى المجموعة الاولى، و٦٠٩و٠ كجم فى المجموعة الثانية • وقد كان متوسط الزيادة اليومية لاسرع حيوان فى المجموعة الاولى ٨١٢و٠ كجم يقابله ٧٣٢و٠ كجم فى المجموعة الثانية •

وفى الفترة النهائية للتسمين كانت الزيادة اليومية ٠٦و١ كجم فى المجموعة الاولى ، ٠٧و١ كجم فى المجموعة الثانية مبينا أن أضافة حبوب الاذرة فى العليقة فى هذه الفترة حسن معدل الزيادة اليومية ولم يكن هناك فرق معنى بين مجموعتى التجربة •

ومن هذه الدراسة يقترح تحضير هذا المخلوط من العلف للاستفادة منكمية كسب القطن الحر غير المقشور بجمهورية مصر العربية والتى تبلغ ٣٠٠ ألف طن سنويا والتى تبلغ قيمتها ١٥٠ الف طن معدل نشأ وكذلك الاستفادة من المولاس لتجهيز نحو ٧٥٠ الف طن من هذا العلف تبلغ قيمتها الغذائية ٣٠٠ ألف طن معادل نشأ وهذا يعمل على زيادة كمية الوحدات الغذائية بنحو ١٥٠ الف طن معادل نشأ مما يسهم فى حل مشكلة الاعلاف فى جمهورية مصر العربية ، وهذا يمكننا من الاستعمال الامثل لحطب الاذرة وزيادة المادة الخام من مكونات العلف لتجهيزها فى مصانع العلف الحالية التى تواجه زيادة كبيرة فى طاقتها المعطلة وتواجه صعوبات فى الحصول على المادة الخام ويمكن تطبيق ذلك على مستوى الدولة تحت أشراف المختصين فى وزارةالزراعة فى جمهورية مصر العربية •

ملحـــوظة :

هذا البحث جزء من خطة بحث طويلة الاجل على الاعلاف الاقتصادية تتبناه وتنسق له وزارة الزراعة ، وهيئة الاستشارات العلمية للتنمية والتكنولوجيا ومحافظة المنوفية وكلية الزراعة جامعة القاهرة .

ونتائج هذا البحث للمؤلفين سبق نشرها فى تقرير مفصل عن « الاعلاف الاقتصادية » ـ علف الهيئة رقم ١ « فى نوفمبر ١٩٧٠ » ـ والمقدم من « هيئة الاستشارات العلمية للتنمية والتكنولوجيا » فى جمهورية مصر العربية للهيئات المعنية بهذا الموضوع •