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Traceability in the alfalfa dehydration chain

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SUMMARY – The recent events that have involved the agricultural and zootechnical sector have evidenced the necessity to focus on the traceability of the productions in order to guarantee, through the direct assumption of responsibility of the producer, quality and genuine goods. SO.PR.E.D., a leading Italian company in the field of forage dehydration has adopted a system which, through compilation of the appropriate file, is able to follow the alfalfa from the growing phase to its working in the factory and its storing in the warehouse for further delivery to the breeder or to the feedstuff producer. The possibility to trace the product that has formed each lot means that each phase of production can be monitored so as to protect the end users.

Key words: Traceability, alfalfa dehydratation, alfalfa pellet, alfalfa bales.

RESUME – *“Traçabilité de la filière de déshydratation de la luzerne”. Les récentes nouveautés qui ont intéressé le secteur des productions agricoles et animales ont montré l'exigence de viser à leur traçabilité de façon à garantir, par un engagement de la part du producteur, la qualité et l'authenticité des produits obtenus. SO.PR.E.D., firme leader en Italie dans le secteur de la déshydratation des fourrages, a adopté un système qui, par des fiches dûment remplies, est en mesure de suivre la production de luzerne tout au long de la filière : production, transformation, stockage et livraison à l'éleveur ou au producteur d'aliments composés. La possibilité de remonter au produit qui a formé chaque lot permet de connaître chaque phase de la production, offrant une garantie supplémentaire au consommateur final.*

Mots-clés : *Traçabilité, luzerne déshydratée, pellets de luzerne, balles de luzerne.*

Introduction

Whereas in traditional agriculture the producer enjoyed the trust of the consumer who, at the moment of buying food or food raw materials, was directly acquainted with its producer and its place of origin, today agriculture has become anonymous. The consumer knows neither the food origin nor the production companies because food raw materials are produced and bought where there is an economic benefit.

With market internationalisation, it is possible to give once again visibility to production chains only through the instrument of traceability, by means of computer technologies, organisation models and managerial systems.

In the agricultural and zootechnical sector, also in the light of recent events (BSE, dioxine chickens, GMO), traceability represents a fundamental component of the quality policy. In this particular field, the productive process of dehydrated alfalfa (Laffi and Pasini 1999), which can be identified and followed in all its phases, allows the feedstuffs producer to give precise guarantees by means of a formal undertaking of responsibility.

Materials and methods

Traceability is an essential element in the quality managerial system, which SO.PR.E.D. has implemented since 2001 in compliance with ISO 9000 norms. It is based on the following points:

(i) Definition of a data survey system comprehending, in the different phases, producer identification, lot of origin, cultivation parameters, product evaluation in the period before harvesting.

(ii) Codification keeping and lot control in the successive phases of dehydration, packing and commercialisation.

The procedures adopted by SO.PR.E.D. Soc. Coop. envisage the filling in of files provided for the purpose:

(i) Growing file (Fig. 1) identifying the associate farmer, the plot grown with alfalfa and reporting the main growing data.

(ii) Land file (Fig. 2) where, for each single mowing, SO.PR.E.D. technicians report the product evaluation in the period before harvesting taking into account the presence of weeds; this file goes with the product and is handed by the carrier to the person in charge of acceptance at the moment of discharge at the dehydrating plant. An on sight evaluation of pre-drying stage, of grass aspect and smell is also given in this file.

(iii) Processing file (Fig. 3) where processing data are given: shift, processing date and hour, inlet and outlet grass humidity from dryer (continuous survey with infrared instruments), processing and cooling temperatures, possible problems, product destination, bales, small bales, pellets, kind of product obtained from working process.

GROWING FILE			
<i>Personal data</i>			
<i>Farmer</i> _____			<i>Ph.</i> _____
<i>Adress</i> _____	<i>Street</i> _____	<i>Place</i> _____	
	<i>Farmer's code</i> <input style="width: 50px;" type="text"/>		
<i>Farm</i> _____	<i>Street</i> _____	<i>Place</i> _____	
<i>Total surface</i> _____	<i>alfalfa surface</i> _____		

<i>Growing crop data</i>					
<i>Previous crop:</i> _____					
<i>Tillage:</i>	Ploughing <input type="checkbox"/>	Plough + subsoiling <input type="checkbox"/>	Grubbing <input type="checkbox"/>		
	Rotary harrowing <input type="checkbox"/>	Harrowing <input type="checkbox"/>	Rolling <input type="checkbox"/>		
	Other <input type="checkbox"/>				
<i>Sowing:</i>	Date	<input style="width: 100px;" type="text"/>			
	Variety: _____	Seed rate Kg / ha _____			
<i>Fertilizer supply</i>	<i>Unit of</i>	<i>Nitrogen</i>	<i>Phosphate</i>	<i>Potassium</i>	<i>Other</i>
	at preparation for sowing:				
	on 1st year:				
	on 2nd year:				
	on 3rd year:				
on 4th year:					
<i>Weed control</i>	<i>Herbicides</i>				
	at preparation for sowing:				
	on 1st year:				
	on 2nd year:				
	on 3rd year:				
on 4th year:					
<i>Pest control</i>	Date:	Date:	Date:		
	Pesticide:	Pesticide:	Pesticide:		
	Date:	Date:	Date:		
	Pesticide:	Pesticide:	Pesticide:		

Date <input style="width: 30px;" type="text"/> <input style="width: 30px;" type="text"/> <input style="width: 30px;" type="text"/>	Farmer's signature _____
	Technician's signature: _____

Fig. 1. Growing file.

Dehydrated alfalfa, provided with the above mentioned codification and information, is stocked in the warehouse where the lots are kept separate for every single typology of product.

With regard to dehydrated alfalfa pellet, for every lot in the warehouse it is possible to show which parts it consists of and then to go back to the farms of origin and to the way the lot was produced.

LAND FILE (to be filled by technician)

Personal data

Farmer: _____ Farmer's code: _____ Ph. _____

Address of land: _____ Place: _____

Crop not suitable for mowing

Cause: _____ Data:

Farmer's signature: _____ Technician's signature: _____

Crop evaluation in pre-cutting step

Date: _____

Mowing: 1[∞] 2[∞] 3[∞] 4[∞] 5[∞] 6[∞]

Weed infestation:		Kind of weed:
Normal	X = < 10%	H = Only grass weeds
High	Y = 10-50%	K = Various weeds
Very high	Z = >50%	W = Dodder

Rain during the field drying (wilting) Any One Most one

Evaluation for the vegetative step	Medium advanced vegetative step	First blossom buds	Advanced blossom buds	First open flower	Advanced blooming	Seed presence
Evaluation:	A		B		C	

Evaluation for the weed infestation, bales destination

<input type="checkbox"/> XH	<input type="checkbox"/> XK	<input type="checkbox"/> YH	<input type="checkbox"/> ZH	<input type="checkbox"/> XW	<input type="checkbox"/> YK	<input type="checkbox"/> YW	<input type="checkbox"/> ZK	<input type="checkbox"/> ZW
Evaluation: 1		Evaluation: 2		Evaluation: 3				

If the destination is only the production of pellet the grass, used for lots composition in the square, will be all of Type 1. Only the grass classed: YK YW ZK ZW will be of Type 2. As for final classification of pellets, the proteins analytic data, will be proved after manufacturing

Big bales and small bales
 1-Type combinations:
 A1 B1

Big bales and small bales
 2-Type combinations:
 A2 B2

Big bales and small bales
 3-Type combinations:
 A3 B3
 C1 C2 C3

The Technician: _____

Grass acceptance on the stockyard (to be filled by the person in charge of acceptance)

Date:

Factory: Shift: 1 2 3 Hour:

Field drying (wilting)

heavy (moisture < 50%) <input type="checkbox"/>	medium (moisture 50/60%) <input type="checkbox"/>	soft (moisture 60/70%) <input type="checkbox"/>	none (moisture > 70%) <input type="checkbox"/>
---	---	---	--

Appearance colour and odour: Normal Abnormal

destination of grass lot: A B C by day:

The responsible: _____

Fig. 2. Land file.

PROCESSING FILE

To recorded by the control panel operator

Factory: **CA' BOSCO** Date:

Control panel operator: Shift n. 1 2 3

Lot A B C Of shift 1 2 3 From hour: to hour:

Dried products: Big bales % Pellet % Small bales %

Initial moisture content:

Temperature of the ingoing gases:

Temperature of the exhaust gases:

Temperature at the end of cooling system:

Final moisture content

Problems during drying process

Dried product: Standard 1 notes:

Standard 2 notes:

Standard 3 notes:

Standard 4 notes:

Big bales from n. to n. Pellet protein content: %

Warehouse in which the product is stored:

Fig. 3. Processing file.



Fig. 4. Label.

With regard to bales, we work on label printing (Fig. 4) which SO.PR.E.D. has since long adopted indicating the production plant, the mowing type, the date, the hour, the processing shift and a progressive number. From a single bale it is thus possible, through the processing lot, to go back to the farms which have grown the alfalfa used to form the lot of said bale.

Conclusions

The control of the several phases of the dehydration process allows to a commercial subdivision of the product to be reached depending on the qualitative characteristics in order to effectively respond to the market requirements. The guarantee towards the end users of alfalfa pellets and bales is also provided by the traceability system that starting from the end product gives the possibility to go back to the producer and to resolve possible problems in the production chain.

References

Laffi, G. and Pasini, P. (1999). Technical and economic aspects of lucerne drying. In: *Proc. of XIII EUCARPIA Medicago spp. Group Meeting*, Perugia (Italy).