

## **COMPARATIVE STUDY REGARDING THE INFLUENCE OF DRY SYSTEM UPON CHEMICAL COMPOSITION OF DJBEL TOBACCO**

**L. Giurgiulescu<sup>1</sup>, P. Săvescu<sup>2</sup>, Dinu Mariana<sup>2</sup>**

<sup>1</sup>North University of Baia Mare, Science Faculty, Victoriei Street, No. 76,  
Baia Mare, Maramureș, Romania

<sup>2</sup>University of Craiova, Horticulture Faculty, A.I.Cuza Street, No. 13,  
Craiova, Dolj, Romania

### **Abstract**

*The Djebel tobacco can dry at indirect fire in two types of drying systems: high drying rooms – the system used are flue curing and low drying rooms – the system used bulk curing. The study propose to analyze who are the advantage and no advantage of two type drying systems and which system are the best in obtain Djebel dry tobacco with high quality.*

**Keywords:** Djebel, drying system, quality index

### **Introduction**

This paper proposed to realize a comparative study regarding the drying of Djebel tobacco from two most knowing drying system of tobacco from our country: classic dryers and bulk curing dryers.

The tall classic dryer have 12 rooms for drying. The total volume of one of this room is 512 m<sup>3</sup> and the utile volume is 380 m<sup>3</sup>. In one room it can be loaded 5500 kg tobacco obtaining 11000 kg in one round. The technological process of drying has included more successive phases which are different through the variation of temperature and air humidity parameters. These phases are: the leaven of leaves, the settle of color, the dryer of limb, the dryer of principal venation, the humidity of dry leaves (Anitia, 1983).

The leaven and the yellow of tobacco realized in two steps. The temperature of dryer room, grown up from the first at second steps between 32-38°C and the relative humidity goes down from 95 at 75%. The process is finish at 38°C.

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The settle of color is realized in two steps, too, with variations from 42 to 50°C. In first step it realized an inactivation of vital process from leaves. In then end of these steps the leaves of tobacco must to be fading at 42°C. In the second step the top and the edge of the leaves are dry and leaf are yellow in totality (Anitia, 1983).

The dryer of limb begins after the yellowing of leaves and it is very quickly. The temperature in this moment is 50-60°C. The dryer of principal venations is realized at higher temperature at 70-72°C and a low humidity at 15%. The cooling and humidification of tobacco is realized at 35°C (Anitia, 1993).

The bulk curing system has dry rooms with individual engines for heating. It included 20 drying rooms. The volume of single room is 134.4 m<sup>3</sup> and the volume of the tobacco cassette is 0.013 m<sup>3</sup>. The technological process in these kind of drying is based on the drying diagram through a strictly control of temperatures and relative humidity of air parameters (Anitia, 1983).

The physical, chemical and biochemical phenomena in a bulk curing system are realized at 32-38°C (depending by the characteristic of tobaccos) and 80-85 % humidity (Giurgiulescu, 2004). The end of leaven phases is realized when 85% from the surface of leaves is yellow. The settle of color is realized through pure physical activity, elimination of water through vapors in the same time with gowning up of the temperature and the reduction of relative humidity. Through these processes it's possible that the foliar limbs and principal venations to be dry. Finally it is realized a remoisten of tobacco leaves (Anitia, 1993).

## **Experimental**

We propose to determinate the chemical composition of tobacco from the both drying system. In this sense we determinate the reduced sugars, albumins, total nitrogen and nicotine concentration. All of these compounds are formulated in percent from dry substances.

We determinate also Kovalenko and Smuck index by the follow formulas:

$$\text{Smuck}^* = \frac{\text{Carbohydrate}\%}{\text{Albumines}\%} \quad (1)$$

$$\text{Kovalenko}^{**} = \frac{\text{Total reduced sugar}}{N_{\text{TOTAL}} - N_{\text{NICOTINIC}}} \quad (2)$$

## Results and Discussions

The Djebel tobacco dried in that two systems were study for two determinate the chemical characteristics through: total reduced sugars, albumines, nicotine, values express in percent (%) from dried substances of tobaccos. On the base of these values it was possible to find the quality index of tobaccos, Smuck\* index and Kovalenko\*\* index. The obtaining values are presented in table 1 and 2.

**Table 1.** Chemical composition of Djebel tobacco dries in classic dryer

Quality class	Reduced Sugars (%)	Albumines (%)	Total nytrogen (%)	Nicotine (%)	Smuck Index	Kovalenko Index
S	12.42	9.43	3.80	1.52	0.74	2.85
I	9.13	9.88	4.21	1.63	0.61	2.35
II	6.32	10.12	4.53	1.68	0.48	1.56

S – superior class

**Table 2.** Chemical composition of Djebel tobacco dries in dryer bulk curing

Quality class	Reduced Sugars (%)	Albumines (%)	Total nytrogen (%)	Nicotine (%)	Smuck Index	Kovalenko Index
S	12.41	8.72	3.50	1.39	0.89	2.91
I	9.21	9.08	4.72	1.51	0.72	2.11
II	7.00	9.84	4.81	1.58	0.68	2.15

The Djebel tobaccos from bulk curing system have a higher chemical composition than tobaccos dry in tall dryers. This thing is confirmed by concentration in reduced substances, higher at Djebel bulk curing at superior, I and II quality classes. The reduced sugars produced an acid reaction of cigarette's smoke in the time of burning and they're giving a fine, sweet taste for smokers. The albumines have a

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negative influence on quality of tobacco giving an unpleasant taste. The classic system of drying is giving higher albumins concentration. On quality class, the highest values of albumins are at inferior classes. In the time of drying because there are a lot of enzymatic hydrolyze process an important quantity of albumin are divided in amino-acids, positive substances for quality of tobacco.

Djebel tobacco has in its own chemical composition highest reduced sugars concentration. This can be observed from the six table values. The best results are for the tobacco drying in bulk curing system at all quality classes.

At Djebel tobacco variety the nicotine concentration registered normal values; the lowest values are at bulk curing system. In the final were determinate the quality index Smuck – the report between totale reduced sugars and albumin substances and Kovalenko – report between total reduced sugars and differences between total nitrogen and nicotinic nitrogen. The higher index prove that in the time of fabrication it was used a superior tobacco, the Djebel tobacco dried in the both system, have very good values of quality index, the best results registering for Djebel bulk curing Superior class.

### **Conclusions**

Djebel tobacco dried in the bulk curing system has better chemical composition like the Djebel tobacco dry in classical system. All of the tobacco obtained from booth system can be used for obtaining superior cigarettes together with another tobacco variety. Bulk curing method is efficiently under technological and economical point of view because it is necessary a lower work capacity for to full a dry room. In the same time it is necessary to use a lower quantity of fuel for the heating of the drying room.

### **References**

- Aniția, N., Marinescu, P. (1983). *Tehnologia tutunului*. Editura tehnică, București
- Aniția, N., Marinescu, P. (1993). *Fiziologia și biochimia tutunului*. Editura tehnică, București
- Giurgiulescu, L., Stoica, F. (2004). Researches regarding the technological potential of Oriental Djebel tobacco cultivated in Oltenia, "*Horticultură – Știință, Calitate, Diversitate și Armonie*", Symposium USAMV – „Ion Ionescu de la Brad”, Iași