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***Nicotiana tabacum* L. cv. *Solaris*: an innovative forage for dairy heifers**

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Introduction

Use an **innovative feedstuff** from a “no-food”
and no-GM plant:

Nicotiana tabacum L. cv. *Solaris*

(PCT/IB/2007/053412)



Introduction



Seeds

Biomass

- Biofuel

- Protein Cake

- Biomethane

- Forage ?

Nicotiana tabacum L. cv. Solaris

Introduction



Analyzing
chemical
composition of
whole plant of
Nicotiana tabacum
L., cv. *Solaris*



See Poster @ Session 17:

"Study on *Nicotiana tabacum* L. cv *Solaris* as a source of biomass for animal feeding"

On field experiment!



Ensiling the whole
plant of *Nicotiana*
tabacum L., cv.
Solaris



Administration of
Solaris silage
(SiloSolaris) to
growing heifers

Materials and methods

- *Lactobacillus plantarum* (Pioneer 11F79) was added to the chopped biomass
- The biomass was positioned in horizontal silo, pressed and covered by plastic bag



- **Silosolaris** was opened after 88 days of ensiling and sampled for analyses



Materials and methods

- **16 growing heifers were selected, weighted and divided in two homogeneous groups: SiloSolaris (SS) and Control (CTR) group**

d0		
	Age, d	Weight, kg
SS Group	359.38 (\pm56.44)	297.63 (\pm47.90)
CTR Group	349.13 (\pm57.26)	298.13 (\pm43.48)

SS and CTR group: average value (\pm s.d.) of age and weight

- **Trial period: 49 days**
- **Environmental and food/metabolic adaptation (d19)**
 - **Daily feed consumption of groups**
- **At d0 and d49 individual Body weighing, Body condition, Fecal consistency and Locomotion scoring carried out**

Materials and methods

- **Balanced diets, calculated isonitrogenous and isoenergetic (880 g CP/d, 5.1 UFL/d), were daily administered to SS and CTR group in two meals**

Feed administered (kg dm/head*d)	SiloSolaris Group (SS)	Control Group (CTR)
Whole-tobacco plant ensiled (SiloSolaris)	1.22	--
Hay	2.80	4.53
Mixture of concentrates	2.03	2.03

Diets composition for the two groups of heifers: SS and CTR Group



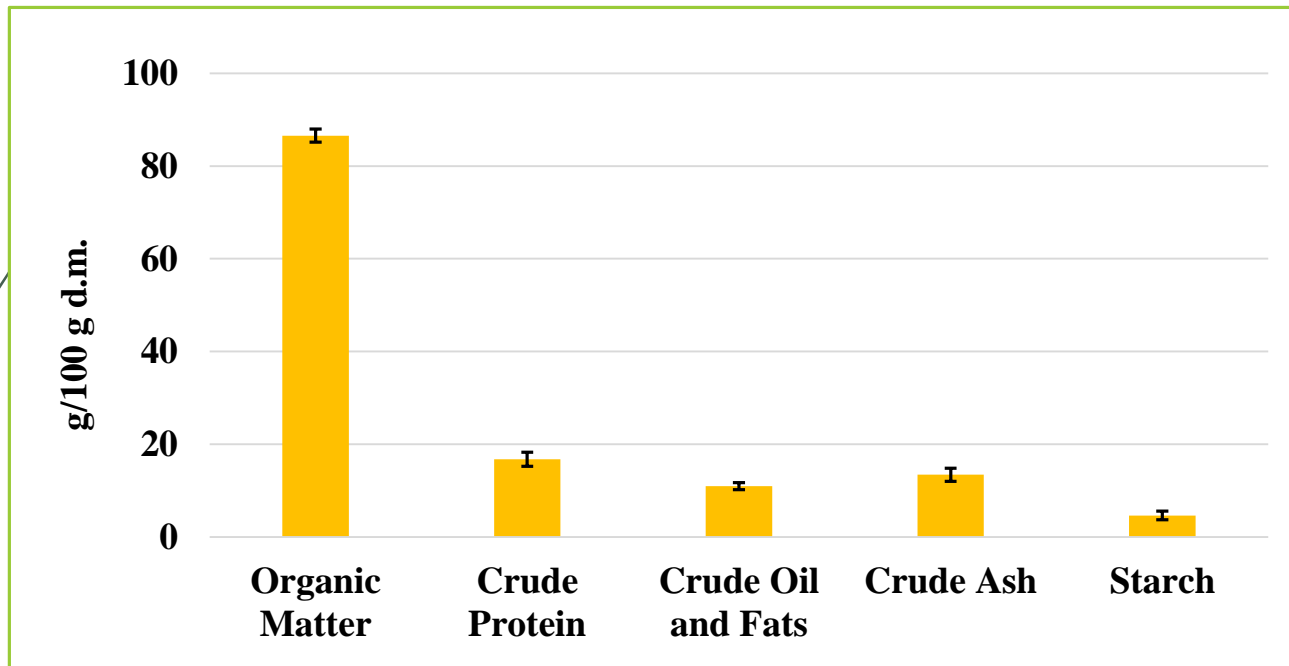
Data were processed by ANOVA (SPSS Inc., Chicago, IL, USA)

Results and discussion

Main chemical parameters investigated on ensiled samples of *Nicotiana tabacum* L., cv. *Solaris*



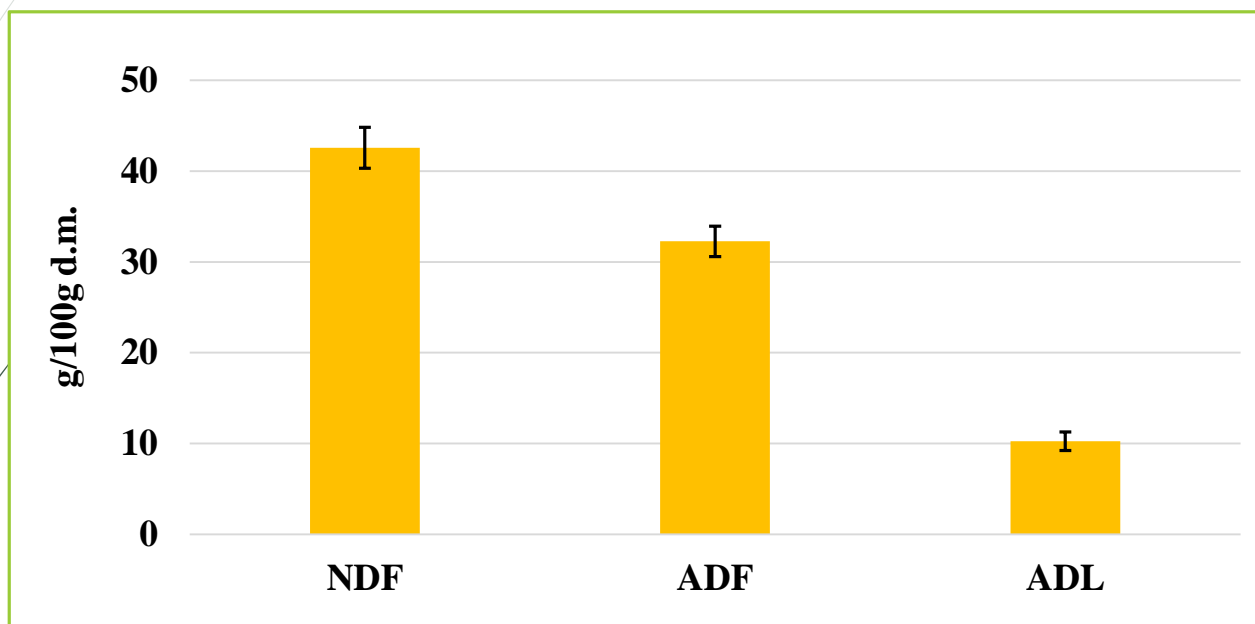
Dry Matter content: 23.23 (± 1.45 , s.d.) g/100 g



Average values (\pm s.d.) Organic Matter, Crude Protein, Crude Oil and Fats, Crude Ash and Starch of the samples

Results and discussion

Main chemical parameters investigated on ensiled samples of *Nicotiana tabacum* L., cv. *Solaris*



Average values (\pm s.d.) of fiber components of the samples

N-NH₃/N_{tot}: 12.26 (\pm 0.98, s.d.)%

pH values were between 4.9 and 5.6

Results and discussion

Mean dry matter **intake**: 5.98 vs. 6.46 kg/head for SS and CTR group, respectively

Mean dry matter **refusal**: 0.05 and 0.10 kg respectively for each animals of SS and CTR Group

kg dm/group	SS	CTR	SEM	P
Intake	47.82	51.67	0.11	0.011
Refusal	0.40	0.81	0.11	0.011

Legend: sme= standard error of the mean; P= Probability.

Average values corrected for each experimental group



Results and discussion

Effects of Solaris silage administration to growing heifers

(19 - 49 d)

Parameter	SS Group	CTR Group	SEM	P
Body weight, kg/head	336.27	333.23	4.27	n.s.
WG, kg/head	42.90	39.85	4.27	n.s.
ADG, kg/head day	0.87	0.81	0.09	n.s.
BSC	3.68	3.51	0.09	n.s.
FS	3.16	3.24	0.09	n.s.
LS	1	1		

Legend:

WG = Weight Gain; ADG = Average Daily Gain; BSC = Body Condition Score; FS = Fecal Score;
LS = Locomotion Score; sme= standard error of the mean; P= Probability; n.s.= not significant.

Average values corrected for each experimental group

Feed conversion rate by group

6.87 kg d.m./kg ADG for SS group vs. 7.96 kg d.m./kg ADG for CTR group

Conclusions

- ✓ Is possible **preserve biomass** of *Nicotiana tabacum* L., cv. *Solaris* through ensiling



- ✓ Silosolaris is **appreciated** and **eaten** by heifers
- ✓ **No significant effects of the dietary treatment** on growth, body condition, fecal consistency and locomotion scores
- ✓ Although these first results need to be confirmed, they show the multitasking potential use of cv. *Solaris* biomass as **ensiled whole plant**, that may contribute to the recovery of tobacco cultivation know-how.



**Thanks for your
attention!**

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