



SINTOTAN

From nature, for health



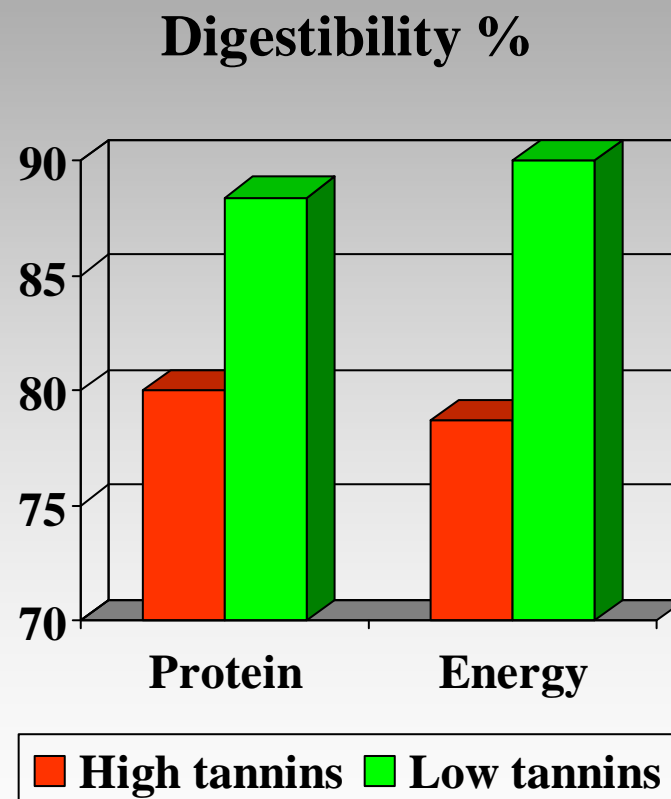
The tannins: not all the same (1)

- Tannins are substances naturally produced from plants in order to defend themselves from aggression of microorganisms, viruses, moulds, but also superior organisms: for that they have antiseptic, antitoxic, antioxidant and even antinutritional properties (ex: sorghum “resistant to bird”)
- Tannins are water-soluble phenols with molecular weight between 500 e 30.000: a great variety of compounds
- The larger part of tannins in vegetables are included in the category of “condensed tannins”, also “proanthocyanidins”, polymers or oligomers of flavinic units
- In some vegetables, and mainly in chestnut, are present tannins of a second type, defined as “hydrolyzable” (esters of gallic acid and of its dimers) which, while maintaining the major part of the biological characteristics of tannins, they do not carry the same antinutritional properties out of a minimal portion

The tannins: not all the same (2)

Condensed tannins have antinutritional properties

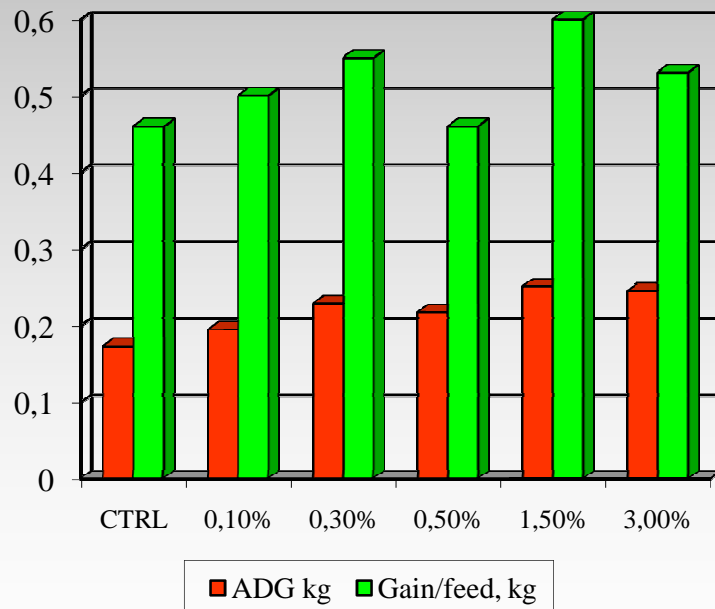
- *Vicia fava* is available in cultivars containing either high (5-10%) or low (<0,1%) levels of condensed tannins
- A recent study evaluated the effects of condensed tannins on the digestibility in swine (*Grosjean et al. JRP 2001, 205-210*)
- Those data confirm what already known in literature



The tannins: not all the same (3)

Hydrolizable tannins do not have antinutritional activity

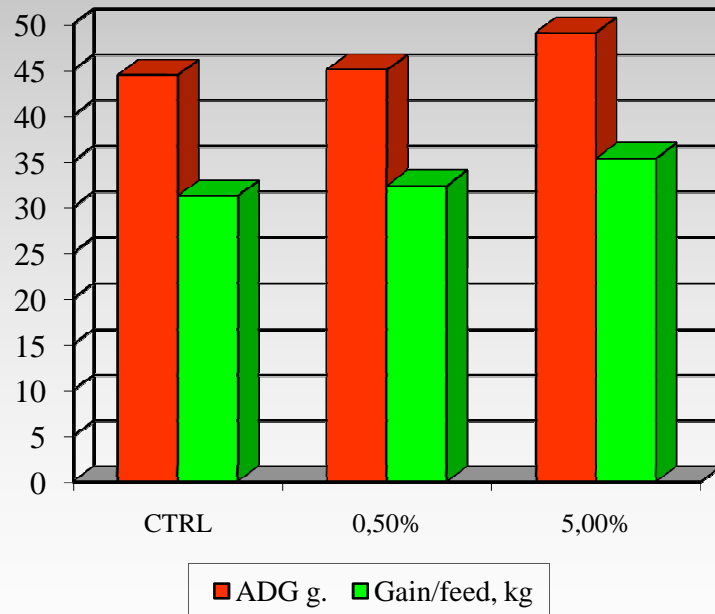
Piglets (6-10kg) performance indexes compared to Sintotan dose (Univ. Lubjiana, 1999)



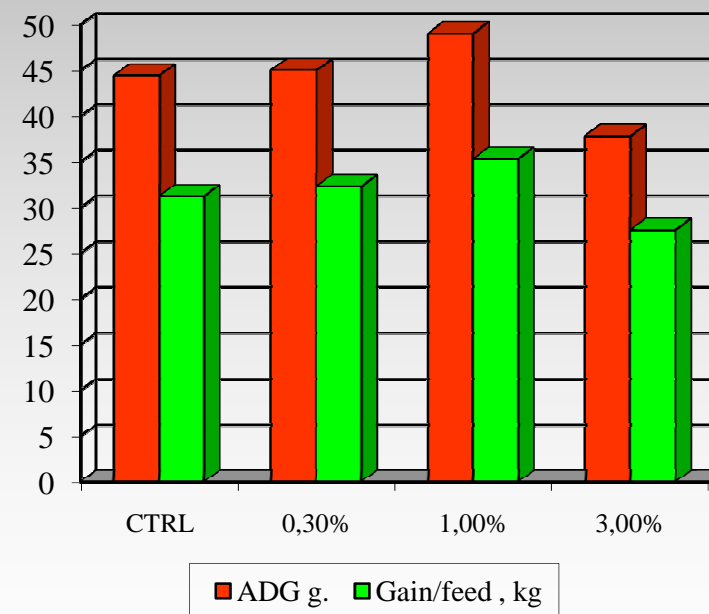
- Hydrolizable tannins, typical of chestnut, do not elicit those antinutritional effects, even maintaining antibacterial and antitoxic properties of polyphenolic compounds
- This has been shown by some toxicity studies of Tanin Sevnica, performed at the Lubjiana University, in swine...

The tannins: not all the same (4) ... and in rabbit

**Rabbits 21 days after weaning,
compared to Sintotan doses (Struklec,
2000)**



**Rabbits 14 days after weaning,
compared to Sintotan doses (Struklec,
1993)**



Why use Sintotan in animal nutrition (1)

- Tannins create with proteins a bound that is relatively stable at a pH close to neutrality (pH 6-7,5). This reaction is *reversible* at pH acid (< 5) only in the case of *hydrolizable* tannins. This information generates different applications, when applied to ruminants or monogastric animals
- The reaction occurs on vegetable protein but also on the protein fraction of the cell wall of bacteria and protozoa. Tannins have a special affinity with the molecular structure of gram + bacteria and of ciliated protozoa.
- Enzymes too, as of protein, are interested from this reaction, in a different extent depending on the *type* of tannin involved.



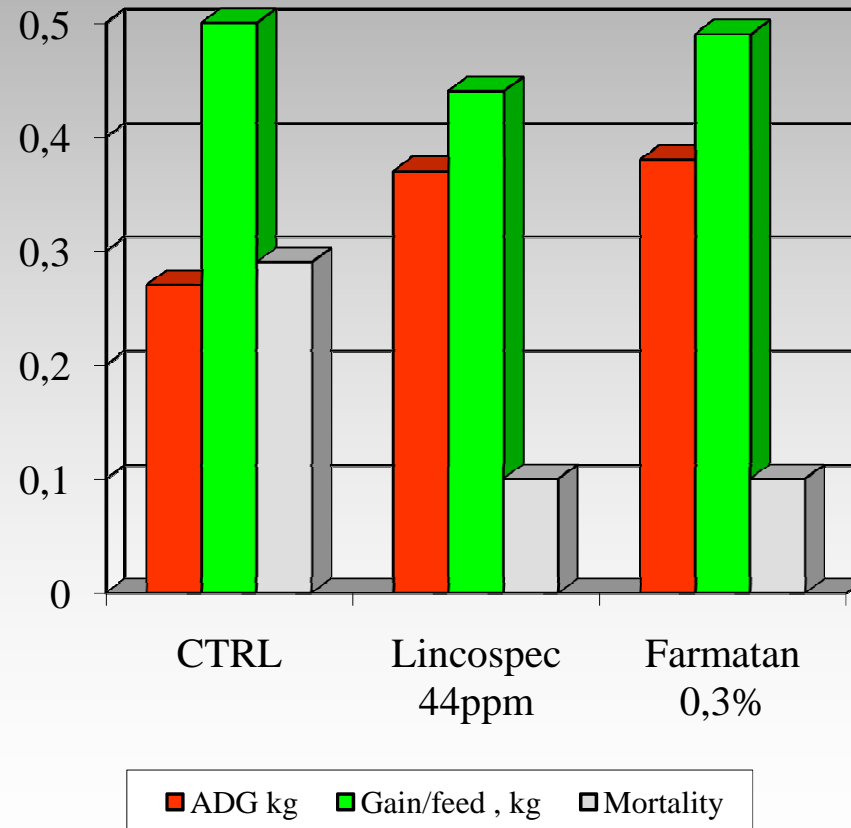
Why use Sintotan in animal nutrition (2)

- In monogastrics, the antiseptic and coagulating activity on proteins is indicated in the prevention and control of many enteric diseases of gram + or protozoarian origin
- In ruminants, the *reversible* coagulation and insolubilization activity is indicated in the control of the ruminal balance between soluble and insoluble proteins. More, the defaunating activity on ciliated protozoa produces an effect of modulation of this population thus increasing the starch bypass.

Sintotan: use in swine

- Many studies show high efficacy of Sintotan in the control of enteritis, both compared to negative controls and compared to antibiotic treatments.
- The used dosage for prevention is equal to 0,3-0,5% of feed

Effect of Sintotan and medication on post-weaning in piglets (6-25kg)
(Gagrcin et al, 1988)



Sintotan in swine: practical

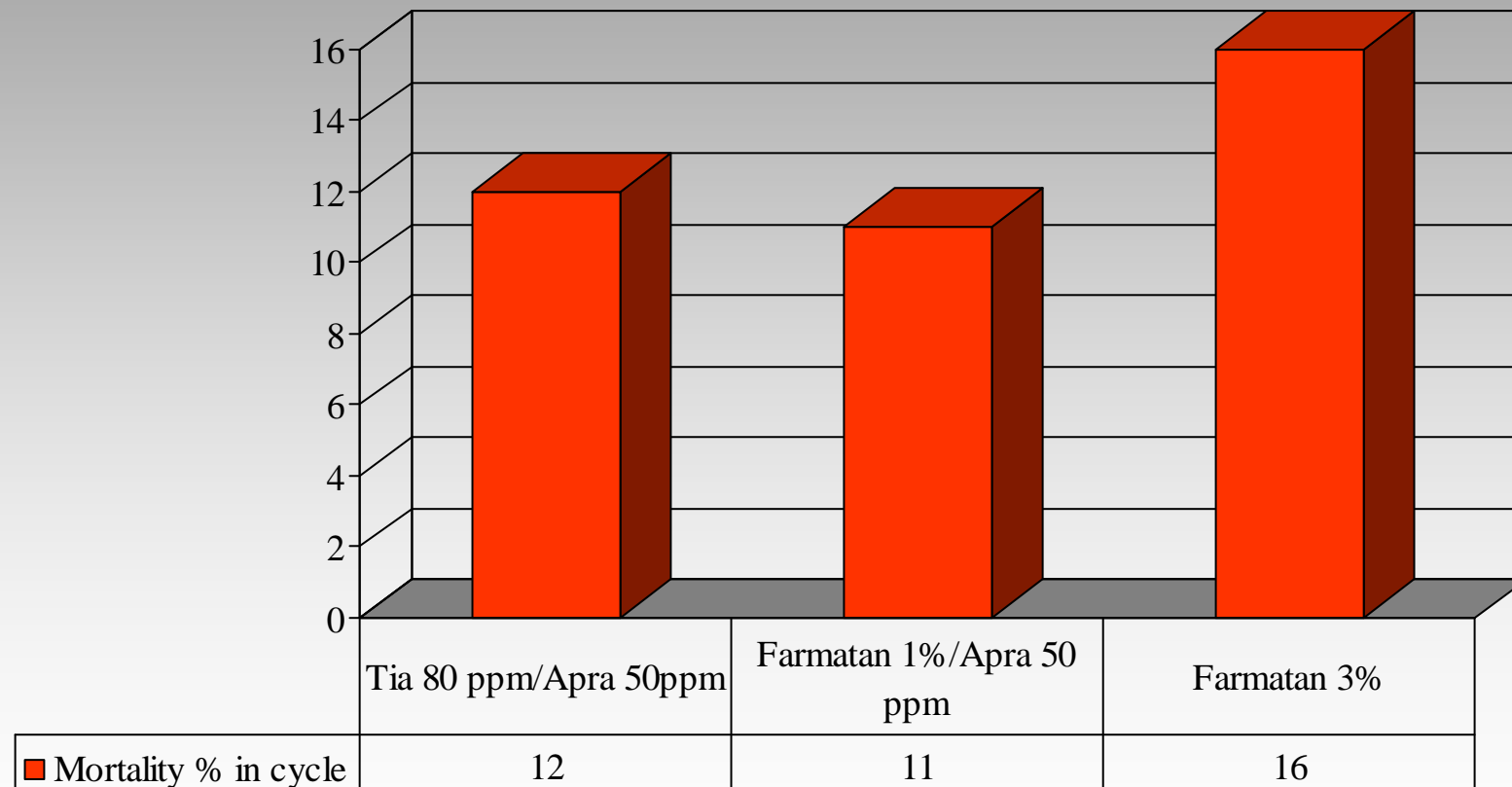
- In weaning diets, a dose of 0,3-0,5% can substitute or potentiate preventive antibiotics
- Acidifiers are synergistic with Sintotan
- No direct information is available on interactions with probiotics
- To counteract sticky feces, that can occur together with the increase in consistency due to Sintotan use, we suggest to add a xylanase complex to the feed
- *In all other swine feeds, in aspecific diarrhoeas, the addition of 0,5 – 1% of Sintotan for 5-7 days allows to re-establish the best health conditions of the animals.*
- *When needed, specific antibiotics can be added*
- *In case of return of the disease, the preventive dose (0,3-0,5%) can be provided without problems for a long period, together with NSP enzymes.*

Sintotan: use in rabbit

- The most important disease in rabbit is today *enterocolitis*
- It is a serious enteritis, which mainly involves the caecum, and causes mortality up to 25-30% of the interested animals.
- The infection flows from mother to litter while lactating, while most frequent damages occur during the first month after weaning.
- The etiology is still unclear, even if there are many evidences proving a prevalent bacterial origin (clostridia) gram + type (always necessary to use a gram + antibiotic, like tiamuline or bacitracin), always complicated from gram – strains (it is therefore always necessary to combine a drug with this tropism – apramycin, colistin, amminosidine -)
- In this context, Sintotan has shown to be able to substitute with excellent results the gram + antibiotic.
- The best result is obtained when Sintotan is included at 0,5/1% in the mother's feed, and when the weaning diet is medicated with the combination of Sintotan plus a gram – antibiotic for the first month after weaning
- Sintotan can be used at a reduced level (0,3/0,4%) also in the remaining period up to slaughter if needed

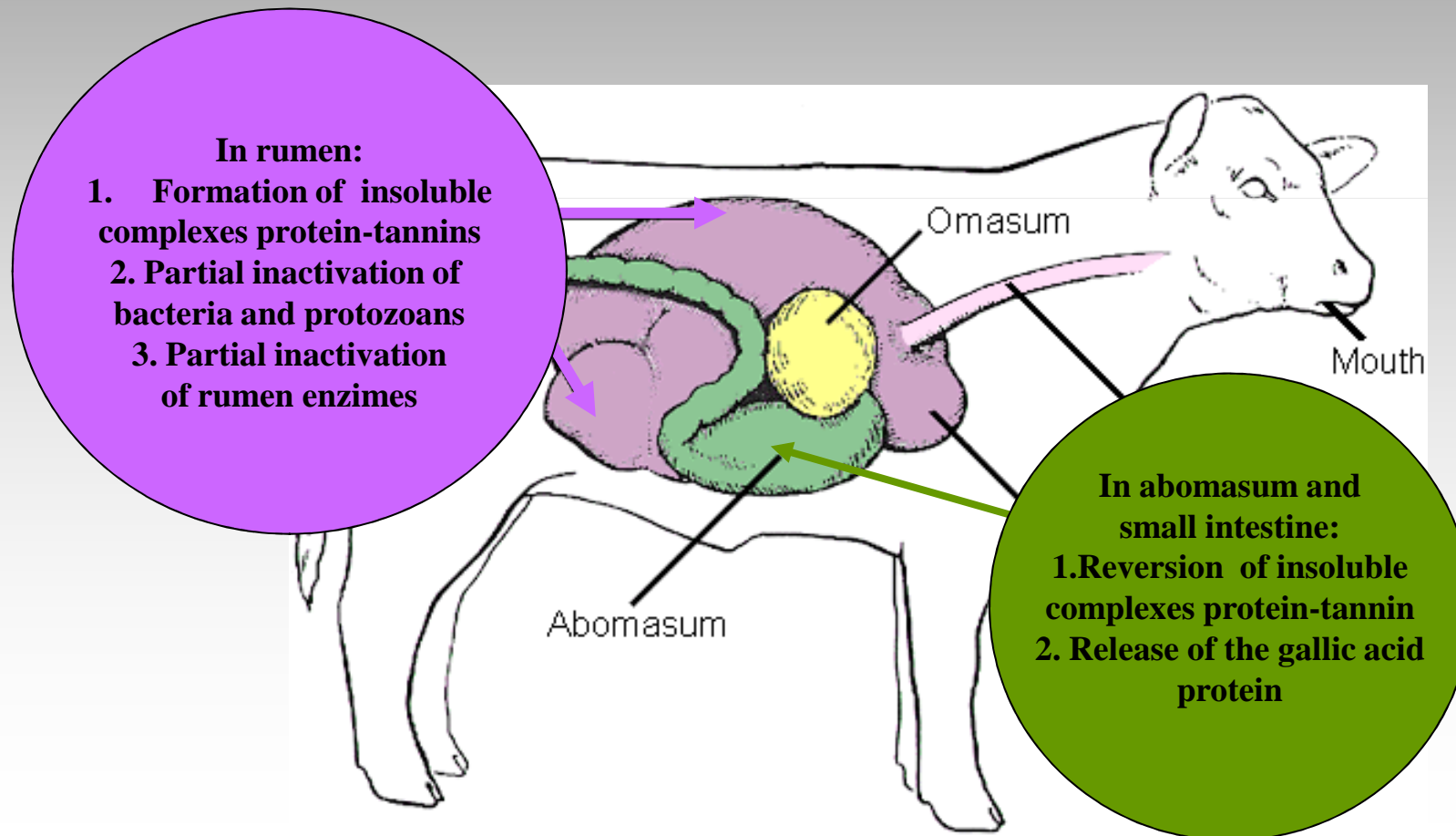
Sintotan in rabbit enterocolitis:

comparison with multiantibiotic treatment (*Baricco,2003*)



Sintotan in ruminants

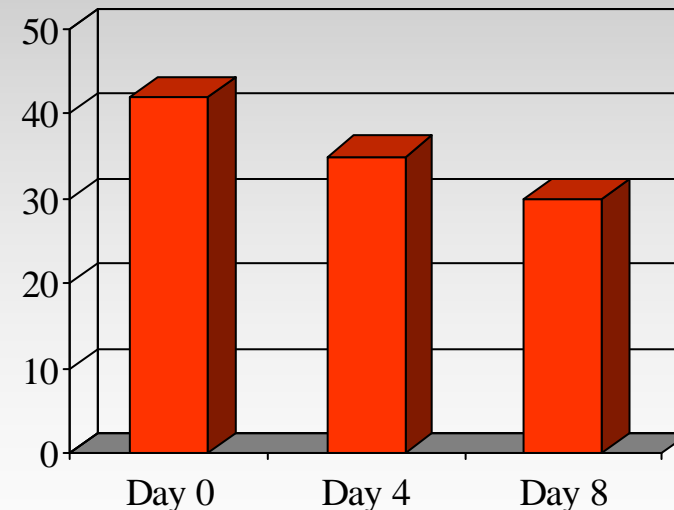
The main activity of Sintotan happens in the rumen through the *reversible insolubilization* of part of the protein. It is to be added the activity on protozoans and bacteria which reduces the amides degradation



Sintotan in ruminants

- The capacity of Sintotan to make temporarily insoluble part of the protein contained in the rumen suggests its main uses:
 - *In dairy cows: it corrects easily and economically the conditions of imbalance between PDIE /PDIN (INRA), i.e. RUP and RDP (NRC)*
 - *In calves: possibility of supplying diets with particularly high protein content, without creating any trouble*

Effect of Sintotan on urea content in milk (mg/dl) in cows subject to very unbalanced ratio of soluble proteinsi (Baricco, 2003)



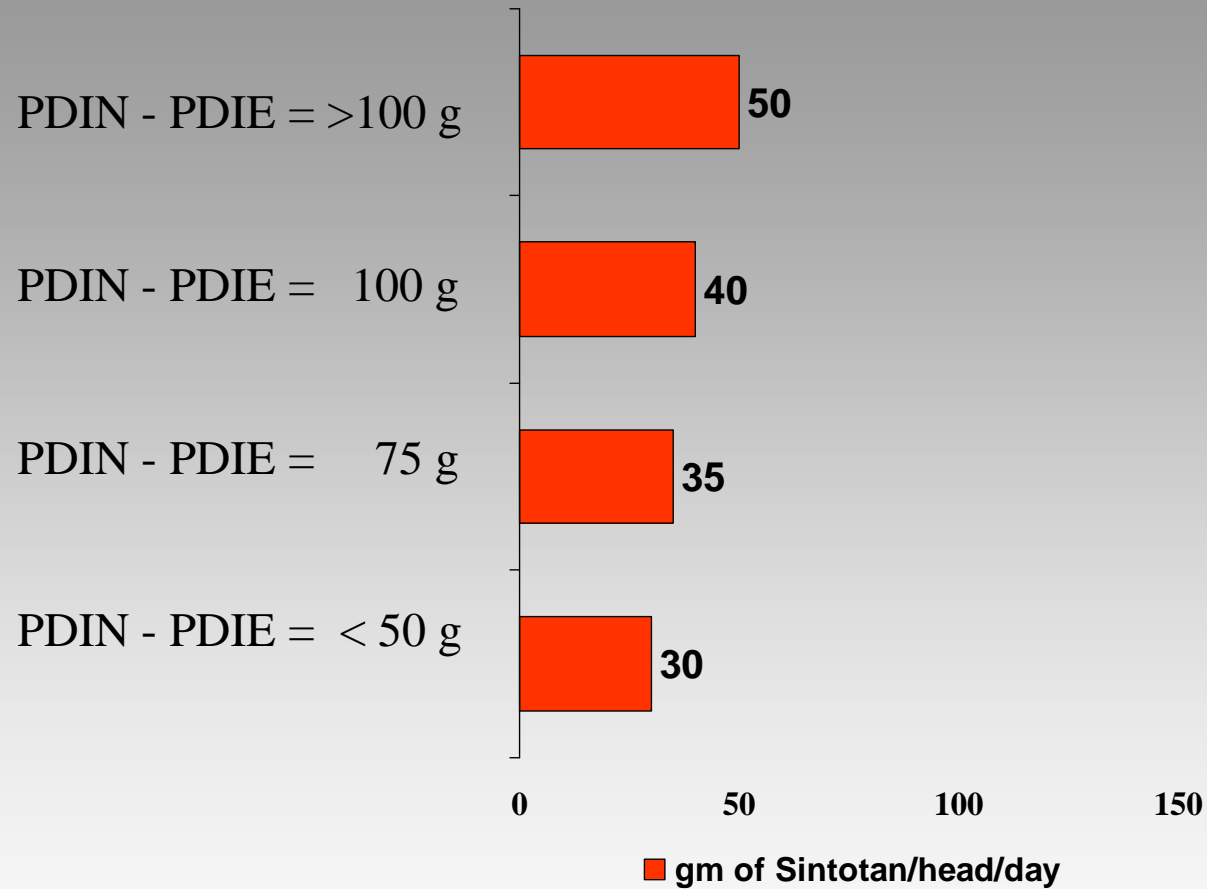
SINTOTAN in cows: THE PRACTICAL DOSAGES

The dosage is subject to the total protein taken by the cow, which is correlated to the daily production

Total protein/day	Liters of milk	Grams of Sintotan /day
<2500	15-20	30
2500/2800	20-25	35
2800/3200	25-30	40
>3200	>30	50

It is suggested, anyway, not to exceed 100 gm/head/day of product

SINTOTAN in cows: THE INFLUENCE OF THE TYPE OF DIET



Sintotan dosage is influenced not only by the total quantity of proteins, but also by the level of rumen solubility of the protein ratio itself. This date is defined by the imbalance between PDIN e PDIE; The bigger it is, the higher is the solubility level of the protein ratio.

SINTOTAN in calves: THE PRACTICAL DOSAGES

The dosage is subject to the total protein taken by the calf, which is correlated to the daily gain.

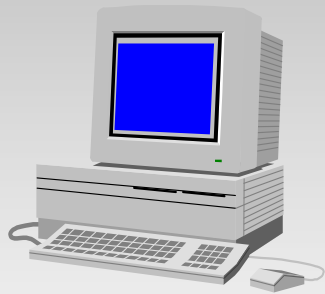
Total protein/day	I.P.G. grams	Grams of Sintotan /day
<1000	<1300	20
1000-1300	1300-1500	25
>1300	>1500	30

It is suggested, anyway, not to exceed 50 gm/head/day of product



SINTOTAN:

how evaluating its value?



- *Because of its particular type of activity, it is clear that we must apply to Sintotan a “ghost value” in the database of the calculator, in order to evaluate during the calculation its peculiar activity. Therefore we suggest:*
- For the evaluation of the balance between soluble and insoluble fractions in the the ratio: give a value of 100% in weight of PDIA e PDIE (Inra) , this is to say in RUP (Nrc) to Sintotan, without changing, respectively, the values in total raw Protein (PG e CP), and in soluble protein (PDIN and RDP)
- For the evaluation of the bypass on aminoacids: give an increase of 10 % of the aminoacids value available at intestinal level of Soybean 44, which remains the fundamental protein ingredient.

Some information on the table

(NRC, Nutrient Requirements of Dairy Cattle, 2001. Adapted)

	PG g/kg	RUPLys gm/kg	RUPMet gm/kg	Dose of ingredient each 150 gm of PG	RUPLys gm in 150 gm of PG	RUPMet gm in 150 gm of PG
Herring	675	53,5	20,4	220	11,77	4,48
Blood	900	81,0	10,5	170	13,77	1,78
Gluten 60	590	9,9	13,8	250	2,47	3,45
Soy 44	440	27,5	6,4	340	9,35	2,17
Soy 44 + Farmatan	440	30,5	7,0	340	10,4	2,4



If, for example, I want to substitute 200 grams of Herring in a diet for cows of 30 liters, which includes 2 kg of soy 44/head/day...

- I take out:
 - 2 kg of Soy 44
 - 0,2 kg of Herring

- Corresponding to
 - 1000 g of CP(PG)
 - 65 g of Lys RUP
 - 16,6 g of Met RUP
 - 1950 g of SS



- *I must add:*
 - *2,3 kg of Soy 44*
 - *40 gm of Sintotan*
- *Which give (according to the foreseen values):*
 - *1000 g di CP*
 - *70 g di Lys RUP*
 - *16 g di Met RUP*
 - *2000 g di SS*

In conclusion

- Sintotan is a modern solution to a different trouble industrial breeding
- Sintotan is being sold over the world since many years ago, with customer's satisfaction
- Sintotan is subject to a high number of experimental confirmations
- Sintotan is also available in granular free-flowing form
- Sintotan does not stop: developments in terms of slow release formulations are under process
- Sintotan works

