

PREVENT PIGLET REGRESSION POST-WEANING

SPRIJEČITI NAZADOVANJE PRAŠČIĆA NAKON ODBIĆA

Ir. G. Schuttert

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INTRODUCTION

The pig industry worldwide accepts levels of performance in the week to month following weaning that are extremely poor. Excuses for this range from the 'fact' that such performance is inevitable and that even if the pigs perform poorly it doesn't matter as they will catch up later. This "acceptance syndrome" comes from the "fact" that farmers believe that piglets undergo such a severe physiological change after weaning i.e. shorter villi, reduced enzyme secretion and activation of the immune system, that better performance is an impossibility.

Before proceeding further, it is important to show that such "facts" need to be questioned. Zijlstra, Whang, Easter and Odle (1996) conducted a trial where piglets were (1) allowed to continue suckling (2) weaned onto dry feed or (3) fed milk replacer, together with dry feed in the period immediately after weaning. Their results showed that where feed intake was maintained after weaning, the pigs out performed those left on the sow. So the "fact" that piglets must perform badly after weaning is not a fact, at all. (Table 1)

Table 1. Effect of weaning regimen on daily gain of early weaned pigs in the early post weaning period
Tablica 1. Učinak režima odbića na dnevni prirast rano odbijenih svinja na početku razdoblja nakon odbića

	Suckled - Sisalo	Treatment - Tretman	
		Milkreplacer ^{&} Nadomjestak mlijeka	Starter Diet ^{&} Početni obroci
Average Daily Gain (d 18-25) g Prosječan dnevni prirast (d 18-25) g			
All Pigs - Sve svinje	288	471***	123***
Large - Velike	296	487**	122**
Small- Male	280	455**	125**

& Pigs weaned at 18 days of age - Svinje odbijene 18. dana starosti

** Differed from suckled pigs - Razlikovali se od sisanih svinja (P<0.01)

*** Differed form suckled piglets - Razlikovali se od sisajućih praščića (P<0.001)

Ir. G. Schuttert, Nutritionist, SLOTEN B.V., P.O. Box 474, 7400 AL Deventer, The Netherlands, Email. gschuttert@sloten.com, tel. +31 570 639999, fax +31 570 626001.

So why do weaned pigs generally perform so poorly? To answer this question, we will consider practical hand guides for successful weaning.

SOW MANAGEMENT

Good management of the farm is the first essential step in pig rearing. The sows should be in sober conditions after lactation when inseminated. During pregnancy the whole feeding scheme should be focussed on creating the possibility for the sow to have a trouble free delivery and start eating as soon as possible afterwards. Only then we have large litters and a sow with good milk production. The ideal circumstances for healthy piglets and successful weaning. When problems during suckling or weaning occur, most of the time we have to consider the sow management at first.

SUCKLING PERIOD

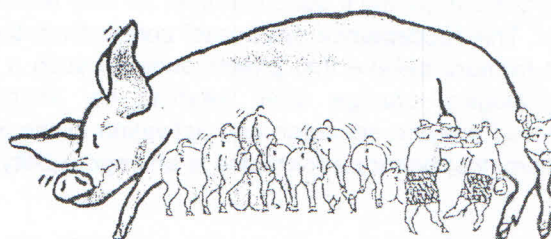
After birth of the piglets one has to start working towards weaning already. First of all we should consider all the problems which (can) occur, to make the evitable. The piglets are most at risk the first few days following weaning. Over this period there are a number of traumatic events taking place

- Removal from the physical presence of the mother
- Removal of the Immunoglobulin protection supplied by the milk of the sow
- Mixing with piglets from other litters
- Disruption of the social hierarchy
- A dramatic reduction in the level of nutrient intake
- A change from liquid milk to solid feed containing vegetable protein and carbohydrate
- Exposure to diseases/sanitary conditions that cause infection or subclinical disease
- Dramatic development of the immune system of the piglet from passive to active immunity.

As shown a good part can be overcome by measurements before and after weaning.

Good piglet development, both prior to and post weaning, requires a well-functioning digestive system. In the first place the digestive system has to extract the essential nutrients from the milk and first consumed piglet starter feed and transports them into the blood. Secondly, a well-functioning digestive system also acts as a barrier against pathogens.

First of all good colostrum intake is very important for digestive development, but even more for creating specific immunity. Keeping the newly born piglets warm and dry will stimulate intake of colostrum. Especially when birth is going slowly, or with large litters, one has to pay extra attention to the last born piglets. 70% of antibodies in the milk should be ingested within the first 12 hours after birth. After that the intestine closes and the permeability of the intestine for maternal antibodies is over after 48 hours.

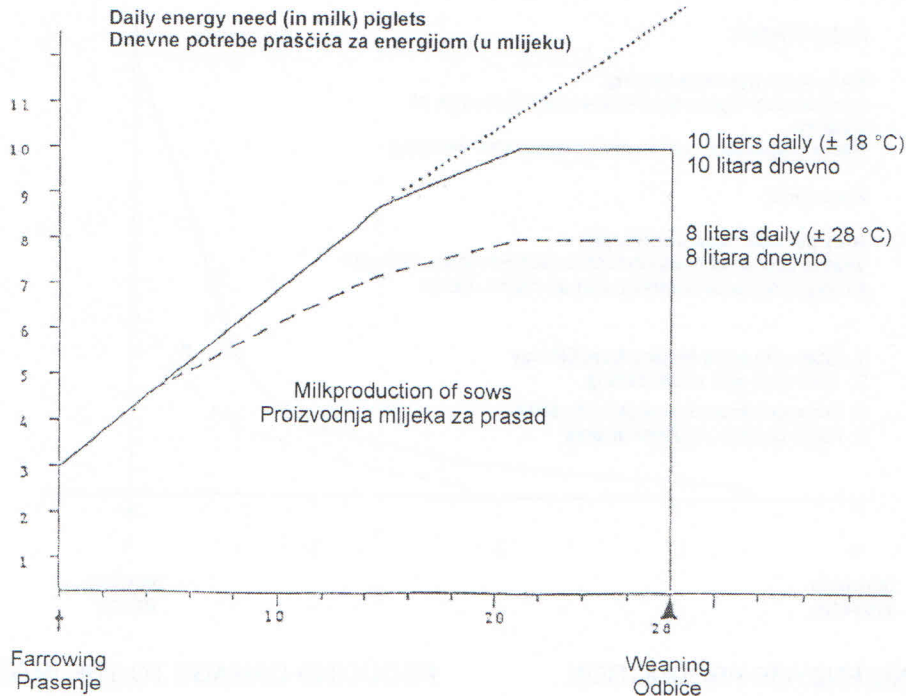


Sow's milk is the best nutrition for young piglets. It contains highly digestible fat, protein and lactose. (table 2)

Table 2. Analysis sow's milk (7th day of lactation)
Tablica 2. Analiza mlijeka krmače (7. dan laktacije)

	19% dry matter 19 % suha tvar	Dry matter based Na bazi suhe tvari	% of energy % energije
Protein Bjelančevina	5.5 %	29.0 %	21.5 %
Fat Masnoća	7.2 %	37.9 %	65.0 %
Lactose Laktoza	5.4 %	28.4 %	13.5 %
Ash Pepeo	0.9 %	4.7 %	-----
	19.0%	100.0%	100.0%

Graph 1. - Grafikon 1.



Analysis of sow's milk shows that the fat content is almost 38 % (dm). The fat contributes for 65 % to the energy supply needed by the piglet for performance.

In practice the energy requirement of piglets is not fulfilled by their feed intake. Neither sow's milk before nor solid feeds after weaning, realize the maximum growth potential. You can find this in graph 1.

Trials in subtropical countries show a maximum feed intake of the sow in lactation of no more than 4.5 kgs per day. From European research we know that a decrease in feed consumption from 6.5 kgs to 4.5 kgs. Per sow per day results in a decrease in milk production of more then 1 litre per day (Black, 1993)

Lower feed intake not only results in less milk production, but also has a negative effect on the waning condition of the sow. Loss of condition of the sow in the weaning period often results in fewer piglets in her next litter. Moreover, to recover from this loss, the sow needs extra feed in the gestation period. To gain one kilo of bodyweight, 5 to 6 kilo's of feed are needed.

Up to an age of 4 weeks a solid feed only never can cover the energy need of a piglet. On the other hand, the growth potential of a piglet during this period is extremely high. A good milk replacer is the only way to supply the extra energy which is needed. This milk replacer should have the following characteristics:

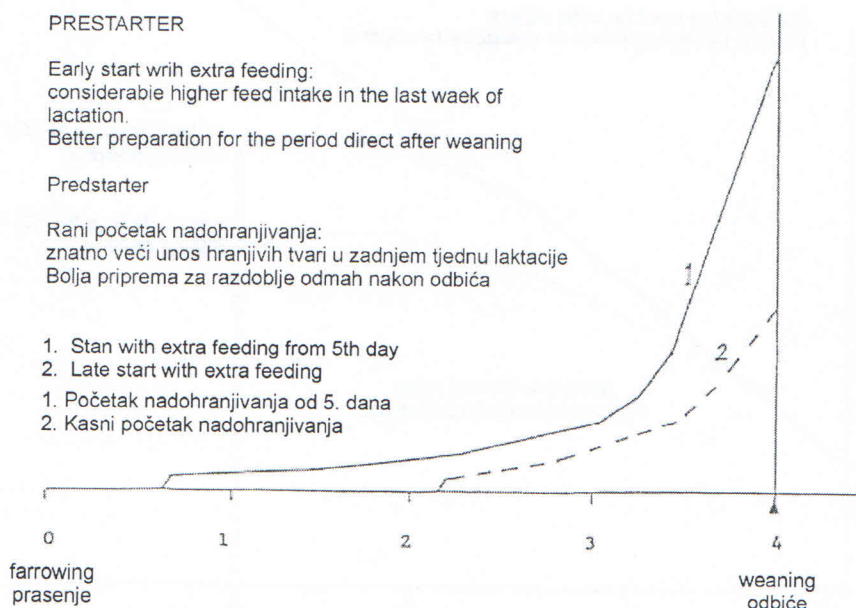
- a high content of milk ingredients
- highly digestible fats

MILK PELLET

In addition to colostrum and milk, it is important that piglets also start digesting special piglet creep feed as early as possible. The digestive system can then adapt to the digestion of non-milk nutrients during the 'safe' suckling period.

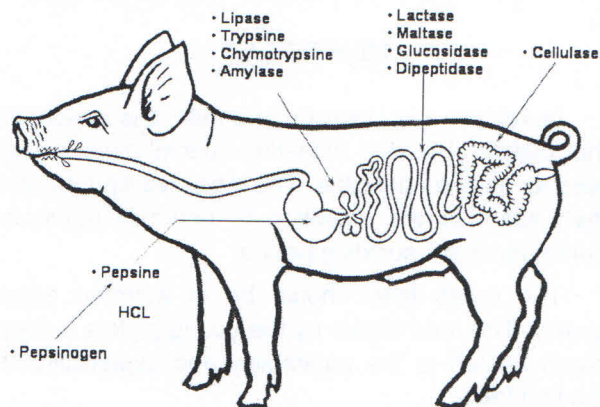
The creep feed should be of extreme good quality. The feed intake by the young piglets is very much related to the palatability and digestibility of the first feed.

Graph 2
Grafikon 2.



STIMULATING ENZYME PRODUCTION

At weaning the gradual development of the digestive system is interrupted all of a sudden. In addition to the elimination of sow's milk, a considerable drop in the production and release of enzymes also occurs immediately post weaning when feed intake is not maintained. Enzymes act to break down nutrients into very small particles that are able to be absorbed into the bloodstream. Good stimulation of enzyme production, especially of those enzymes that break down non-milk matter such as vegetable protein and starch, can be achieved by making an early start with the supplementary feeding of a good creep feed



REDUCING DAMAGE TO THE INTESTINAL VILLI

The intestinal surface area of an 8 kg-piglet with healthy intestinal villi (finger-like projections of the mucous membrane lining the small intestine), is 200 to 300 m²: the same size as a tennis court! Or to put it another way: the total surface area of the intestinal lining is 750 times bigger than the surface area of a garden hose of the same length. Well-functioning intestinal villi are extremely important to rapid and problem-free absorption of nutrients.

However, a certain amount of damage to the intestinal villi nearly always occurs immediately after weaning, resulting in the efficient absorption of nutrients into the body being disturbed. In addition, the recovery process for these damaged intestinal villi also consumes a great deal of energy. Energy that is absorbed from feed, which as a result is prevented from contributing to or benefiting healthy growth.

When a piglet digests sufficient solid feed in the period before weaning, the intestinal lining is better prepared for the period immediately post weaning. The damage that normally occurs to the intestinal villi is then partially avoided as a result.

Table 3. Effect of feed intake on piglet performance and gut morphology post weaning**Tablica 3. Učinak unosa hranjivih tvari na performansu prašćića i morfologiju crijeva nakon odbića**

	Treatment - Tretman				
	1	2	3	4	5
Weaning weight - Težina kod odbića (kg)	8.9	9.0	9.1	9.2	9.2
Empty body weight gain - Povećanje težine praznog tijela (g)	-	231a	49b	253a	463c***
Voluntary daily feed intake - Dobrovoljni dnevni unos hrane(g)	-	286a	102b	234a	400c***
FCR	-	1.0	-	1.1	0.9
Villous height - Visina dlačica (vilusa) (um)	449a	366b	330b	432a	499c***
Crypt depth - Dubina kripte (um)	144	157c	119a	141b	151bc **

Figures with different letters differ significantly - Pisano drugačijim slovima - razlika je značajna From Pluske et al (1996)

OPTIMUM FEED INTAKE BEFORE WEANING

A total intake of 400 to 500 grams per piglet before weaning provides an optimally developed digestive system and results in considerably less damage being caused to the intestinal villi immediately post weaning. If, for example, an E.Coli-infection should occur after weaning, the mucous membrane in the intestines of piglets that have had a sufficient feed intake before weaning will be far more resistant to the bacteria. In addition to which a higher piglet weaning weight is also achieved.

An early intake of solid feed also ensures a sufficiently low level of stomach content acidity, and good development of the secretion of digestive juices. The balance of the intestinal flora post weaning is also less drastically disturbed if piglets have taken up sufficient solid feed before weaning. Moreover, the burden on a sow with a large litter is considerably reduced when the litter has a good feed intake.

UNDESIREP PIGLET REGRESSION POST WEANING

On many pig rearing farms piglet regression is usually observed during the first week post weaning. In particular a piglet feed intake that is too low plays an important role in this respect. A piglet with a weaning weight of approximately 8 kilograms must consume between 180 - 200 grams per day in the

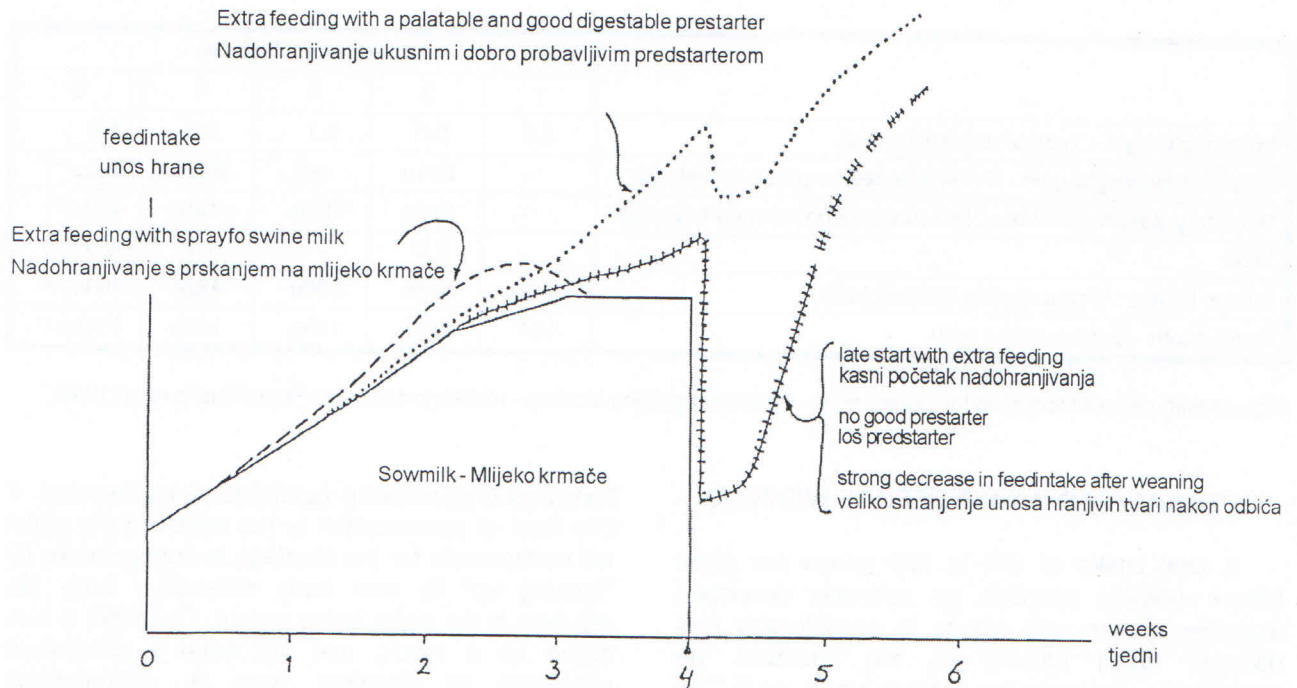
first days post weaning (guideline: 2 kg/litter/day). If this level of consumption is not achieved the piglet will compensate for the shortage in energy intake by "burning up" its own body reserves / body fat, resulting in the piglet losing weight. The piglet is less active as a result, and will have a diminished resistance to diseases such as post-weaning diarrhoea for example. The piglets develop a 'sharp back', often have rougher hair, and as a result of diminished resistance also become sensitive to high infection pressure.

AVOIDING 'OVER-EATING' POST WEANING

Following low (or no) feed intake in the first days post weaning, the enzyme production will also be considerably reduced. In addition an undesirable increase in the level of gastric acidity (higher pH of the stomach content) takes place, which consequently reduces the piglet's resistance.

If the feed intake of the piglets abruptly increases 2 to 3 days after weaning to compensate for the resultant energy loss, problems may arise. A sudden increase in feed intake from 3 days post weaning, the familiar 'over-eating' pattern, can lead to incomplete digestion. In the period prior to the piglets starting to 'over-eat' the digestive system is at a virtual standstill, and is consequently overwhelmed by the sudden availability of feed. Undigested feed remnants form an ideal breeding ground or substrate for the explosively reproductive harmful strains of E. Coli bacteria.

Graph 3.
Grafikon 3.



FEEDING RECOMMENDATIONS

From the above it is evident that a variable feed intake is undesirable. The feed advice offered by SLOTEN B.V. (Holland), which has been thoroughly tested in practical situations in co-operation with the CLO-institute De Schothorst, helps prevent excessive piglet regression post weaning.

The piglets have to be trained to consume solid feed before weaning. In the week prior to weaning a tasty and easily digestible mini-milk-pellet (booster feed) ensures extra growth and the preparation of the digestive system (due to the secretion of digestive juices and subsequent conditioning of the intestinal lining).

By continuing to feed the prestarter / mini-milk-pellet for 2 full days post weaning (guideline: 2 kg per litter per day), and then gradually mixing the mini-milk-pellet with weaned-feed, a gradual feed intake will be achieved without any undesired peaks and drops.

Enzyme production remains stable as result. Owing to the high intake of the tasty mini-pellet the

energy, vitamin and mineral requirements of the piglet are completely for-filled. Piglets do not regress post weaning.

Due to the high proportion of milk products and optimum digestibility, a supple changeover from sow's milk to weaned-feed is guaranteed.

The advantages of early supplementary feeding with prestarters (mini-milk-pellets), and a correct feed strategy post weaning, are aimed at the 'after-effect' in particular. In the initial days, and especially weeks post weaning, the difference between piglets that have and have not been given supplementary feed in the suckling period becomes increasingly more obvious.

GROWTH WITH A HEALTHY RESULT

"Well begun is half done", as the saying goes. Piglets with good growth in the period after weaning are more economical to feed before the start of the fattening stage. The differences between slightly

regressed piglets and heavy piglets at 14 days post weaning becomes increasingly more noticeable as slaughter approaches. The investment in special creep feed is rapidly recovered by healthy growth with better feed conversion, less use of medicine and lower occupation of piglet pens. Furthermore you will be supplying hog farmers with piglets that are more uniform and of a higher quality.

LITERATURA

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narudžbenica

PRIRUČNIK

O PROIZVODNJI I UPOTREBI

STOČNE HRANE - KRME

Uredili:

Dr. sc. Franjo Dumanovski,

znanstveni savjetnik,

Zdenko Milas, dipl. ing. agr.

Ime i prezime

Institucija

Telefon

Fax

Broj komada

Potpis