APC natural feeding concepts

- Considerable lower Production costs
- More Sustainability

poultry

NATURAL FEED ADDITIVE BLENDS

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Company APC - about us

Agrar **P**roduktion und **C**onsulting GesmbH, abbreviated as **APC**, is an Austrian company that is engaged in animal feeding in a very innovative way. The company was founded in year 1995 and through its employees, APC has more than fifty years of experience.

Today, the environment issue, regarding emission of harmful gases and use of nitrogen and phosphorus from manure is more up to date than ever.

The usage of **APC feed additive blends** allows reducing the content of proteins and phosphorus in the mixed feed for monogastrics by up to 25%. The consequence is a lower usage of phosphorus and protein in compound feed which today mostly comes from soya meal and feed phosphates.
In APC formulas soya meal is replaced by cereals and/ or corn, which leads to large savings in transport and is therefore extremely positive from an ecological point of view.

So, **APC** is clearly positioned in the sector with development and production of innovative and future-oriented products and thereby laid the foundation for a successful future.

As a location for offices and administration was choosed Gleisdorf (20km) near Graz, Austria which is a location with excellent infrastructure.

APC produces its natural feed additive blends in a work-sharing partnership with the company Schöllerbacher, ERES Tierernährung, located in Wolfern near Linz which is also close connected to the Austrian net of highways.

ERES Schöllerbacher is specialised in the production of premixes and has long lasting experiences in this technical field.

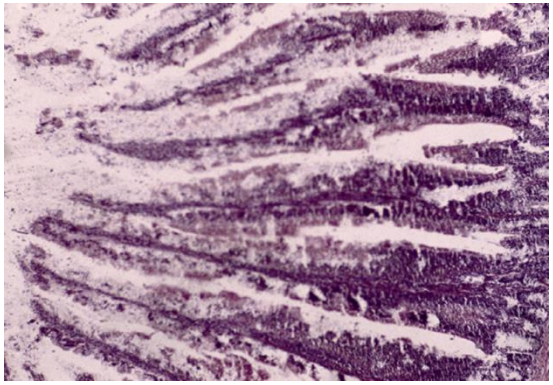
APC natural feed additive blends

- ✓ **APC natural additive blends consist from special clay minerals with synergistic effects, herbs and ethereal oils**
- ✓ We achieve high effects by a special physical processing
- ✓ The inclusion rate is 2kg per ton ready feed

The effects are:

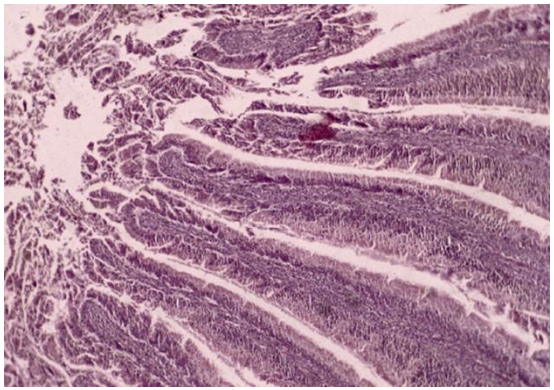
- ✓ Increased and improved surface of the mucosa membrane from the intestine
- ✓ by that we achieve a better absorption rate of all nutrients, focused on protein and minerals.

The APC feeding concept for a healthy mucosa of the intestine



Mucosa of the intestine with conventional feed

- ✓ partial damaged mucosa
- ✓ Inadequate absorption rate



Mucosa of the intestine with APC natural additives

- ✓ healthy mucosa with large surface
- ✓ high absorption rate

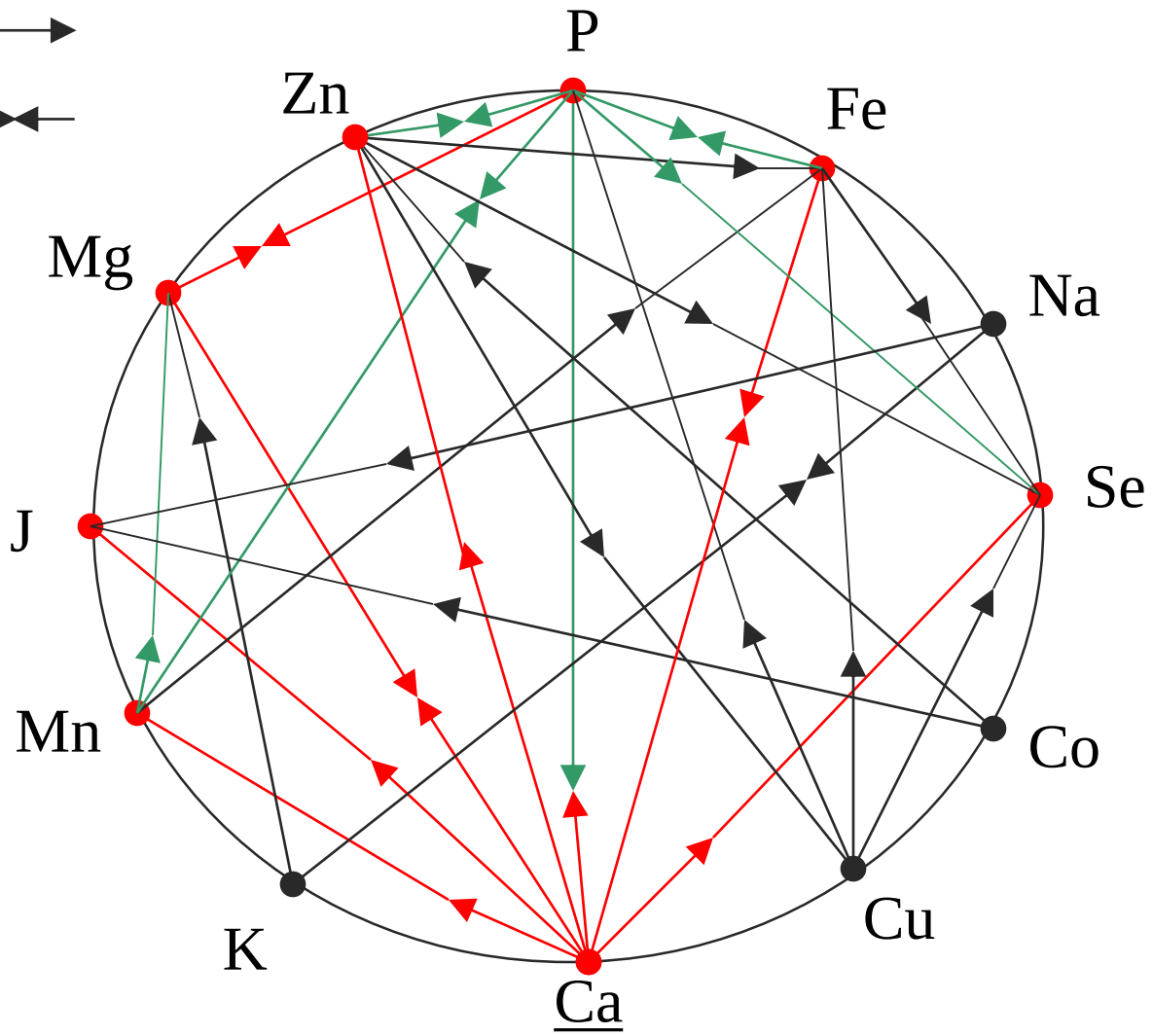
With APC feeding with reduced minerals

- ✓ Reduced acid puffer capacity of the feed = lower ph in the intestine,
- ✓ Increasement of lactobacterials in the small intestine means less pathogen bacteria's = more healthy animals!
- ✓ Reduced antagonism of the minerals.

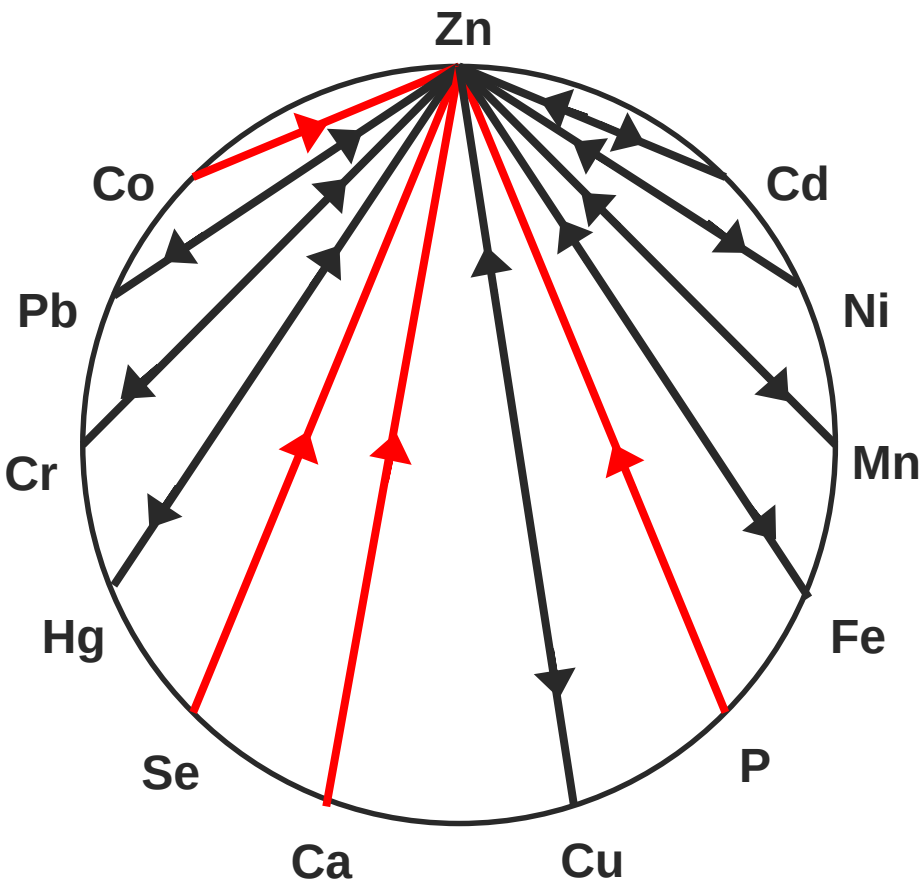
Mutual relation of macro- and trace elements

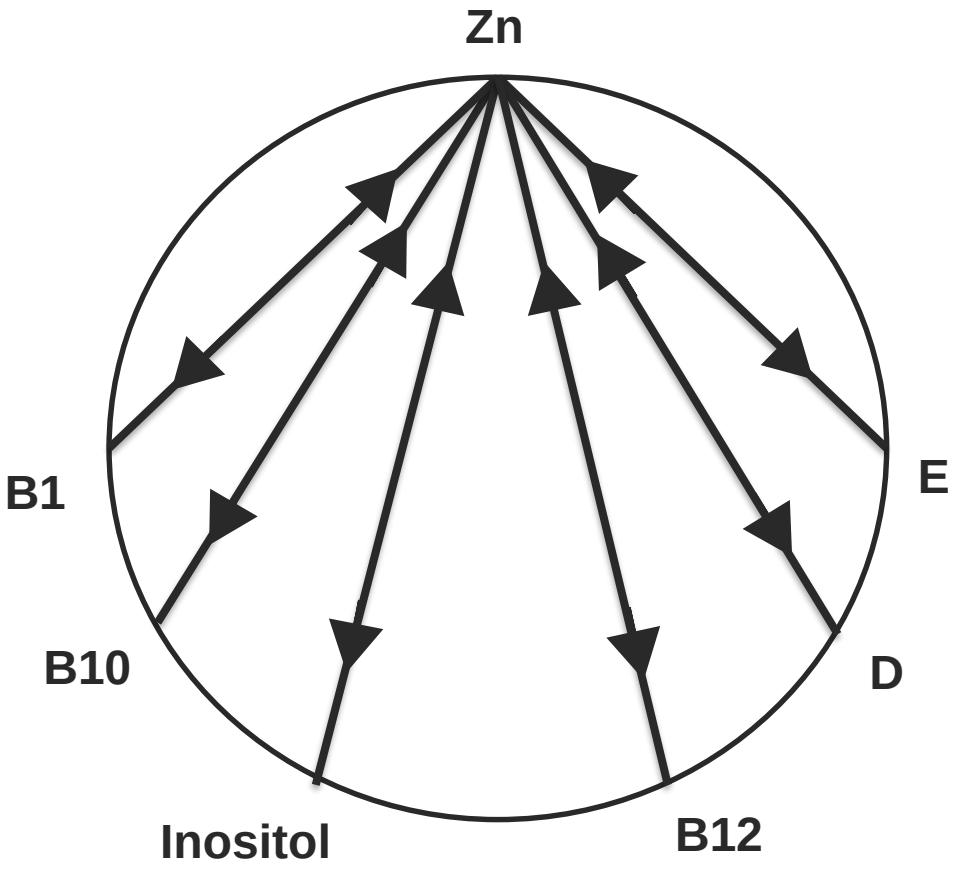
One-side relation →

Mutual relation ⟷



As well there are antagonisitic reactions between trace elements, minerals and vitamines





One-side relation

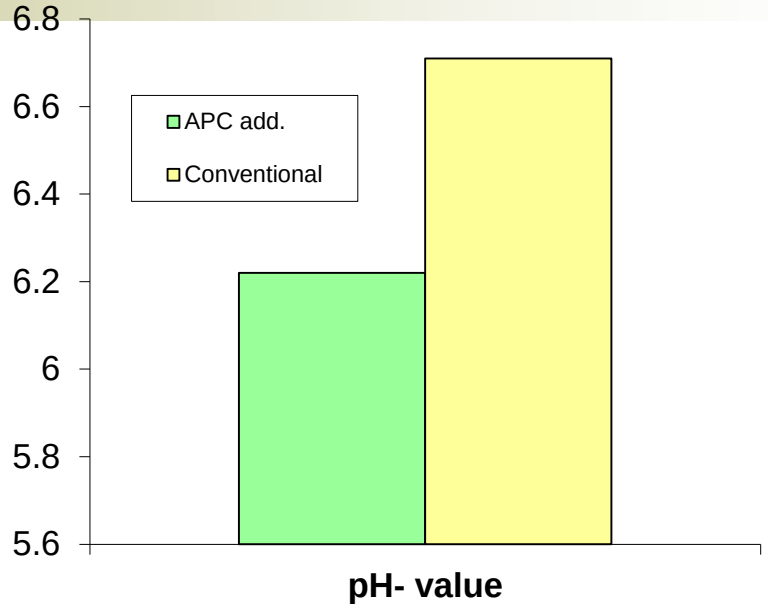
Mutual relation

With APC protein-reduced feeding

- ✓ Considerable relief of the metabolism-relief and protection of the liver
- ✓ Strong reduction of bad gases and up to 50% ammonia reduction in the stables!
- ✓ Resulting in a better natural immunity!
- ✓ Reduced N und P contents of the excrements = Relief of the environment

Lower ph in the intestine with APC natural feed additives

group	pH
APC (A)	6.22±0.22[a]
Control (B)	6.71±0.31[b]



groups	ratio-Lactobacillus / Coli bacillus	Lactobacillus	Colibacillus	Total Microflora
A (APC add.)	1.625[a]	6.5×10^{6}	0.4×10^{7a}	1.15×10^{7a}
B (conventionell)	0.01[b]	0.5×10^{6}	4.0×10^{7b}	5.0×10^{7b}

source investigations of the University Teheran, 2003
group A: with 0.2% APC natural feed additive blends
group B: with conventional feed

APC feeding concept for poultry

… for your animals…

- ✓ high performance – very stabile persistence for layers by
- ✓ strong relief for the metabolism of the liver – **more healthy animals – less mortality**
- ✓ healthy intestine because high concentration of lactobacterials
- ✓ up to 50% less Ammonia – less sickness of respiratory tract

… for your better economy …

- ✓ less feed costs because reduction of soya
- ✓ **better feed conversion ratio caused by better absorption of nutrients**
- ✓ with top performance better economy
- ✓ clearly better egg shells = less broken eggs

… for the environment …

- ✓ less bad smell – up to 50% lower ammonia
- ✓ more dry stables – less water consumption
- ✓ reduced N- and P- excretion

Gumpenstein investigates emmissions and performance on broilers with APC

✓ **Reduced protein and phosphorous**

	APC	Control	APC	Control	APC	Control
RP g/kg	228,1	242,8	212,6	225,3	201,1	210,3
P g/kg	6,75	6,75	6,75	7,05	6,57	6,73

✓ **Strong reduced ammonia**

Reduktion in 2 replications with APC:

Ø in the outgoing air (chimney): **- 49,80 %**
Ø per kg gain of bodyweight: **- 42,58 %**

✓ **Better performance with APC by sustainable production**

With 2 replications:

Ø gain of bodyweight: **+ 9,20 %**
Ø feed per kg gain (FCR): **- 5,85 %**
Ø mortallity: **- 33,00 %**

summary:
Gumpenstein recommends:

APC should be taken in the list of BAT (best available techniques)

Growing layer chicks-Austria

- ✓ **Farm**: Stumpf Martin, 20.000 layer chicks, age 15 weeks, weight 1.300 g
- ✓ Feed intake: **4,95 kg per layer chick** (99.100kg feed total)
- ✓ Feed conv.: **3,81 kg** feed per 1 kg gain

Lohmann braun Classic

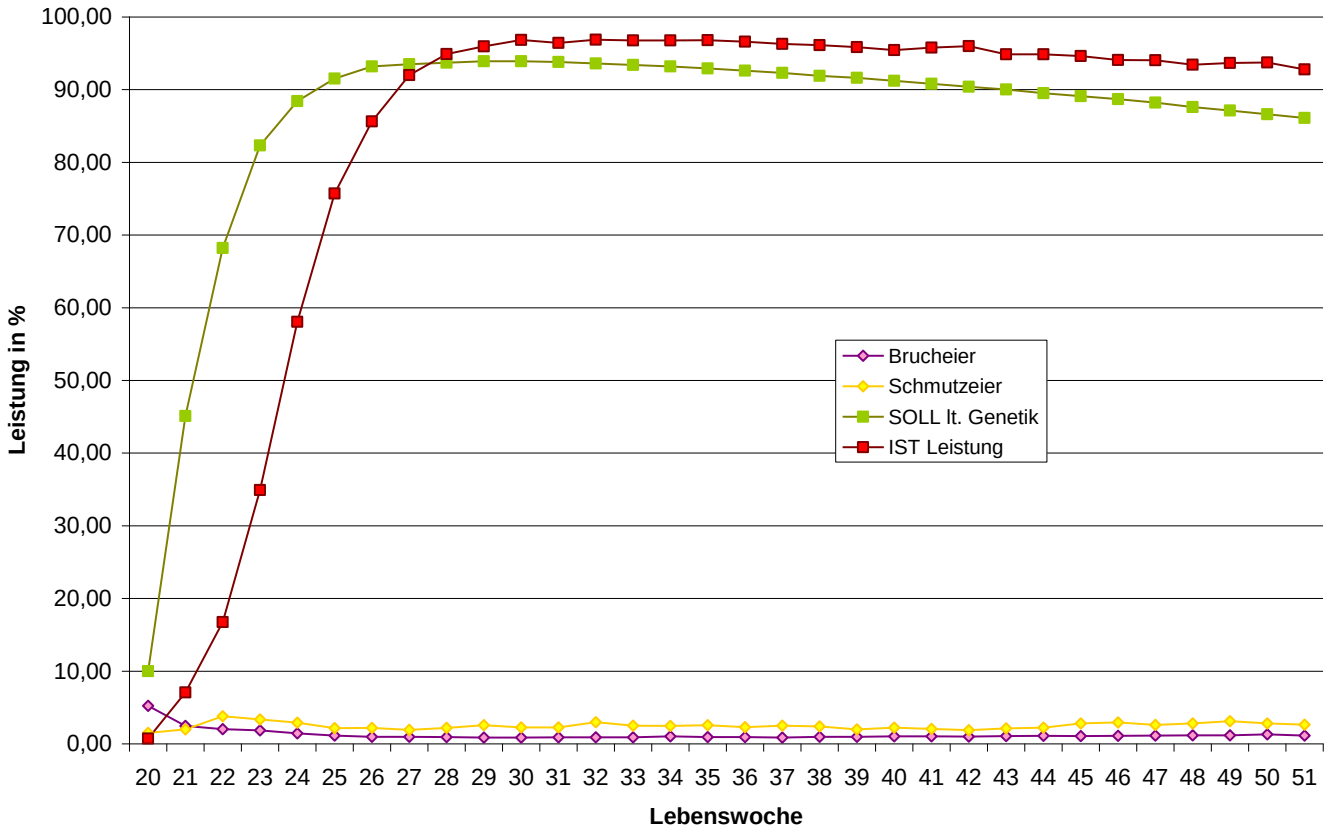
		weeks	weight		used feed		Used feed 7days	
			gr.		Day/gr.		7 days	
			Acutal-value	Set-value	Actual-value	Set-value	Actual-value	Set-value
15.07.2013		4	200	275	25	28	175	196
22.07.2013		5	310	367	30	35	210	245
29.07.2013		6	475	475	40	41	280	287
19.08.2013		9	810	782	54	55	378	385
26.08.2013		10	890	874	57	58	399	406
09.09.2013		12	1050	1043	64	64	448	448
16.09.2013		13	1170	1123	67	65	469	455
30.09.2013		15	1300	1264	67	70	469	490
							4.950	**5.264**

✓ **very good uniformity**

✓ **good development of feathers**

Reference layers - Hungary

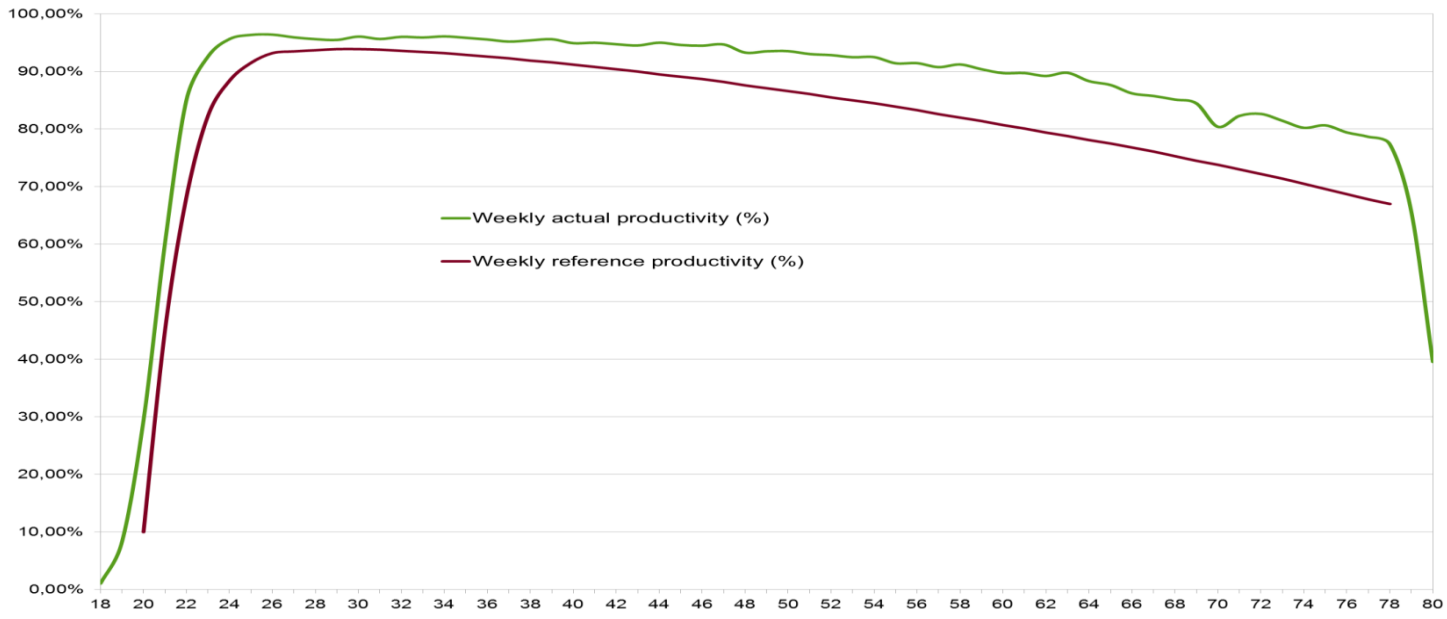
Farm:	Szabo Laszi, 40.000 Layers / Cages
Date of housing:	03.11.2008
Ø Feed consumption:	116g/ hen/ day



Results Laying hens - Hungary

Farm: Szabo Kft., Hungary, Laying hen farm with 40.000 hens
results from the flock 2011/ 2012

	Age of the hens (weeks)	Number of the hens	Mortality	Broken eggs	Dirty eggs	Sum of the eggs	Reference productivity (%)	Actual productivity (%)	difference in percent	difference in percentage points
Performance data:	**80. life weeks**	251.550	218 **0,5%**	9.350 **3,7%**	4.560 **1,8%**	194.630 **77,4%**	65,5	77,4	18,1	11,9
Performance data in average:	**Ø 20.- 78. life weeks**	16.325.449	4.550 **11,3%**	252.790 **1,5%**	290.837 **1,8%**	14.522.707 **89,0%**	82	89,0	8,4	6,9



Results from trials and investigations from the University Sidi Thabet, Tunisian-BROILER

Results of Broilers with APC add. 0,2 %

Results life weigth:

Group	Weight at 47 days (g)
Conventional	1982.7184^{b}
Barley $^{-}$ APC^{+}	2030.2926^{a}
Barley $^{+}$ APC^{-}	1860.3673^{c}
Barley $^{+}$ APC^{+}	1860.8158^{c}
± SEM	49.5

Conversion rate- FCR:

Group	Conversion rate
Conventional	2.17^{b}
Barley $^{-}$ APC^{+}	2.08^{a}
Barley $^{+}$ APC^{-}	2.31^{d}
Barley $^{+}$ APC^{+}	2.21^{c}
± SEM	0 .0004

The results in the same column with different letters are significant.

Results from trials and investigations from the University Sidi Thabet, Tunisian

Results of Broilers with APC add. 0,2 %

Percentage of carcass and breast meat

Group	*Carcass rate*	*Percentage of breast meat*
Conventional	*58,8%*	*33.78%*
Barley $^{-}$ APC^{+}	*59,6%*	*35.26%*
Barley $^{+}$ APC^{-}	*55,1%*	*30.58%*
Barley $^{+}$ APC^{+}	*59,0%*	*33.85%*

Number of coli form germs in the intestine:

groups	Total coli forms (10 UFC/ml)
Conventional	62^{c}
Barley $^{-}$ APC^{+}	0.71^{a}
Barley $^{+}$ APC^{-}	216^{d}
Barley $^{+}$ APC^{+}	20^{b}

The results in the same column with different letters are significant.

results from ammonia measurement :

groups	ammonia (ppm)
Conventional	30
Barley $^{-}$ APC^{+}	18
Barley $^{+}$ APC^{-}	50
Barley $^{+}$ APC^{+}	20

Results from trials and investigations from the University

formulas with APC add. 0,2 % :

%	Control group	Trial group APC
corn	48.708	56.910
soya 44%	23.393	16.500
barley	15.000	15.000
Premix CMW	4.000	4.000
oil	1.000	1.000
limestone	7.699	6.590
salt	0.200	

parameters of performance:

	laying perform.%	FCR	mortality	broken eggs %
trial group APC	77.906[a]	2.372[a]	0.6440[a]	1.7449[b]
control group	76.380[a]	2.442[b]	0.9149[a]	2.0636[a]
± SEM	0.9231	0.021	0.0123	0.1012

	egg weight (g)	form index	calour of yolk	height (mm)	thickness of shells
Trial group APC	64.923[a]	76.250[a]	9.2750[a]	5.4250[a]	0.3472[a]
Control group	64.330[b]	76.250[a]	9.2167[a]	4.8083[b]	0.3380[b]
± SEM	1.2711	1.211	0.016	0.1231	0.0011

the results in the same column with different letters are significant

Broiler comparison feeding APC - Tunisia

	APC group	conventional group
Number of animals	13.000	13.000
Final weight per broiler	1,742	1,742
Feed conversion ratio	1,62	1,85

Total used APC feed			Total used conventional feed		
Starter:	0,5 kg price per kg 0,723 DT/kg	**total: 0,362 DT**	Starter:	0,5 kg price per kg 0,723 DT/kg	**total: 0,362 DT**
Grower:	1,0 kg price per kg 0,772 DT/kg	**total: 0,722 DT**	Grower:	110 kg price per kg 0,695 DT /kg	**total: 0,765 DT**
Finisher:	1,322 kg price per kg 0,706 DT/kg	**total: 0,933 DT**	Finisher:	1,62 kg price per kg 0,665 DT /kg	**total: 1,077 DT**
Total cost of feed (raw material only:		**2.02 DT per Broiler**	Total cost of feed (raw material only:		**2,204 DT per Broiler**

	APC group	conventional group
duration of feeding	34 days	38,8 days
total used feed per animal	2,822 kg	3,223 kg
average daily feed intake	83 g	83 g
average daily gain	50 g	44,47 g
mortality	3,19 %	3,19 %

✓ **This is 10 % less feed costs, 12,37 % less fix costs and 12,37 % higher turnover with APC feed!**

Comparison data from Layer, Dubai

Performance data's of Layers fed conventional compared with the innovative APC feeding system

Description:

The following tables and diagrams shows laying performance, egg weight, broken eggs and the mortality of two different feed groups, one group conventional feeding and one group with APC nat. add. in the UAE.
The farm is producing with 300.000 laying hens and is rearing their own layer chicks, 100.000 at once.

Comparison:

Conventional feeding group		**APC feeding group**	
Genetic:	Lohmann LSL	Genetic:	Lohmann LSL
observation period:	Nov. 2010- Apr. 2011	observation period:	Sept. 2011- Feb. 2012
age of the hens:	20st- 42nd life week	age of the hens:	20st- 42nd life week
group size:	85.800 hens	group size:	75.930 hens

Results:

Because of the better results with the APC feeding concept the whole farm is feeding with APC!

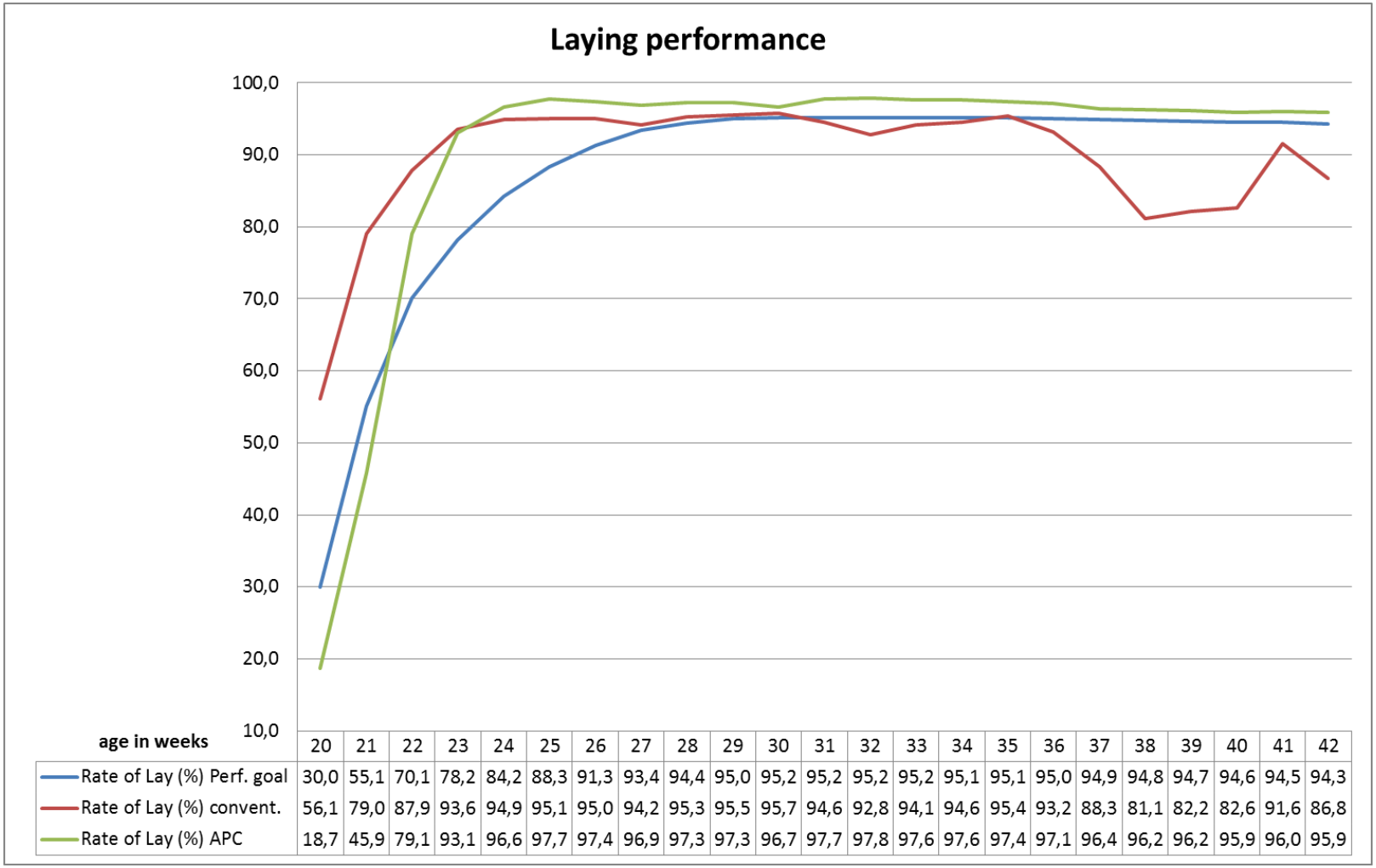
1.) The performance of laying in all halls is increased, especially the young groups shows a higher peak and better persistence.
2.) The egg weight in average is much better than ever before. The cat. Large eggs is increased by 50%, the cat. Medium eggs is reduced by 19% and the cat. Small eggs is reduced by 28%!
3.) The percentage of broken eggs is much lower this means more saleable eggs in total!
4.) The mortality of hens is lowered because of less burden for the metabolism and reduced NH4 in the halls with APC nat. add.!

Feeding details/formulas

	Conventional	APC group
Corn	54,8%	65,7%
Soya 44%	23,0%	19,0%
Wheat bran	6,0%	2,8%
Limestone	10,0%	7,4%
Palm Oil	0,7%	0,7%
MCP	1,4%	0,8%
Rest	4,0%	3,8%

- ✓ Soya reduced by 17,4 %
- ✓ MCP reduced by 57 %
- ✓ Energy increase from 2550 Kcal to 2750 Kcal

Comparison data from Layer, Dubai

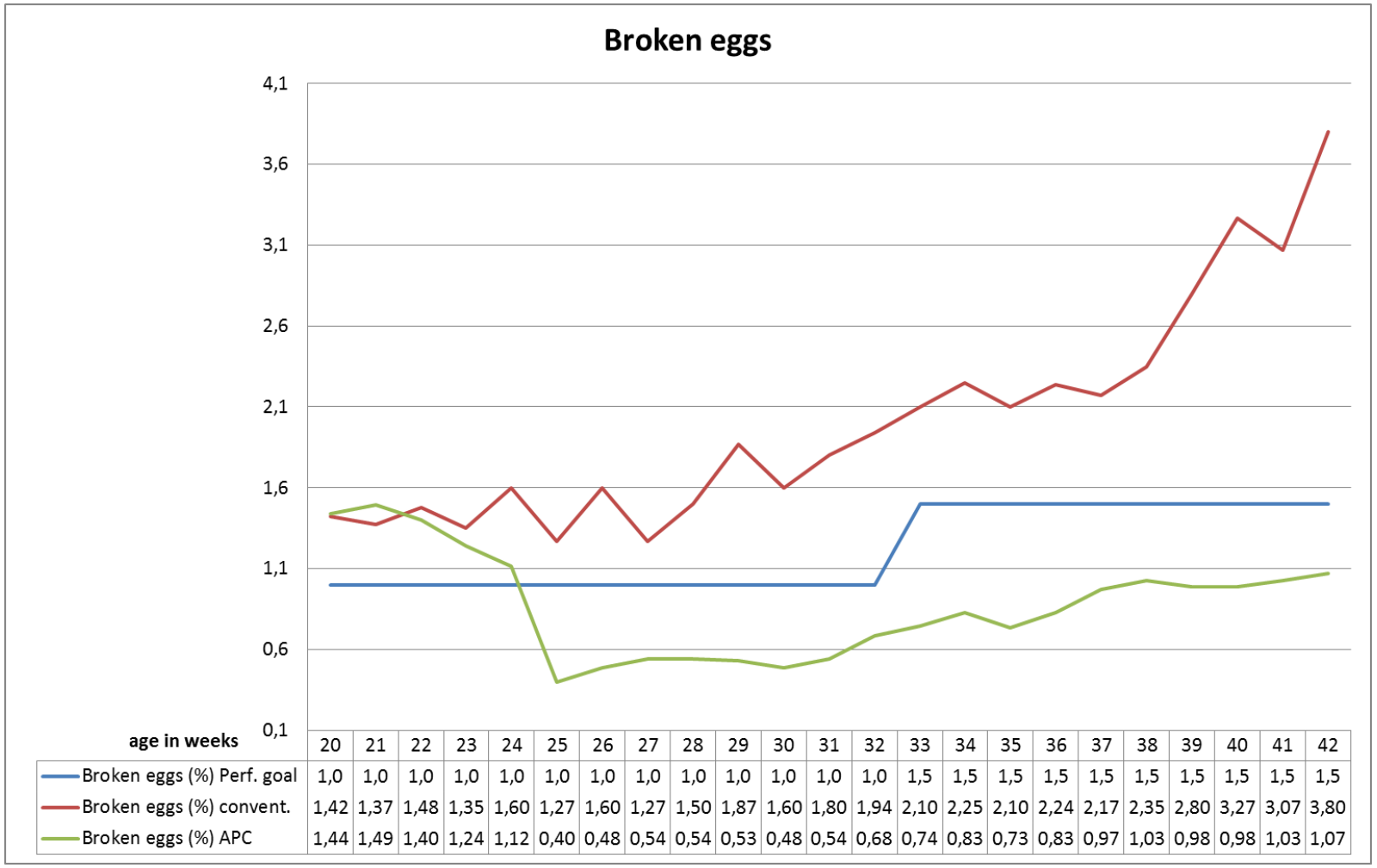


age in weeks	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Rate of Lay (%) Perf. goal	30,0	55,1	70,1	78,2	84,2	88,3	91,3	93,4	94,4	95,0	95,2	95,2	95,2	95,2	95,1	95,1	95,0	94,9	94,8	94,7	94,6	94,5	94,3
Rate of Lay (%) convent.	56,1	79,0	87,9	93,6	94,9	95,1	95,0	94,2	95,3	95,5	95,7	94,6	92,8	94,1	94,6	95,4	93,2	88,3	81,1	82,2	82,6	91,6	86,8
Rate of Lay (%) APC	18,7	45,9	79,1	93,1	96,6	97,7	97,4	96,9	97,3	97,3	96,7	97,7	97,8	97,6	97,6	97,4	97,1	96,4	96,2	96,2	95,9	96,0	95,9

Comparison data from Layer, Dubai

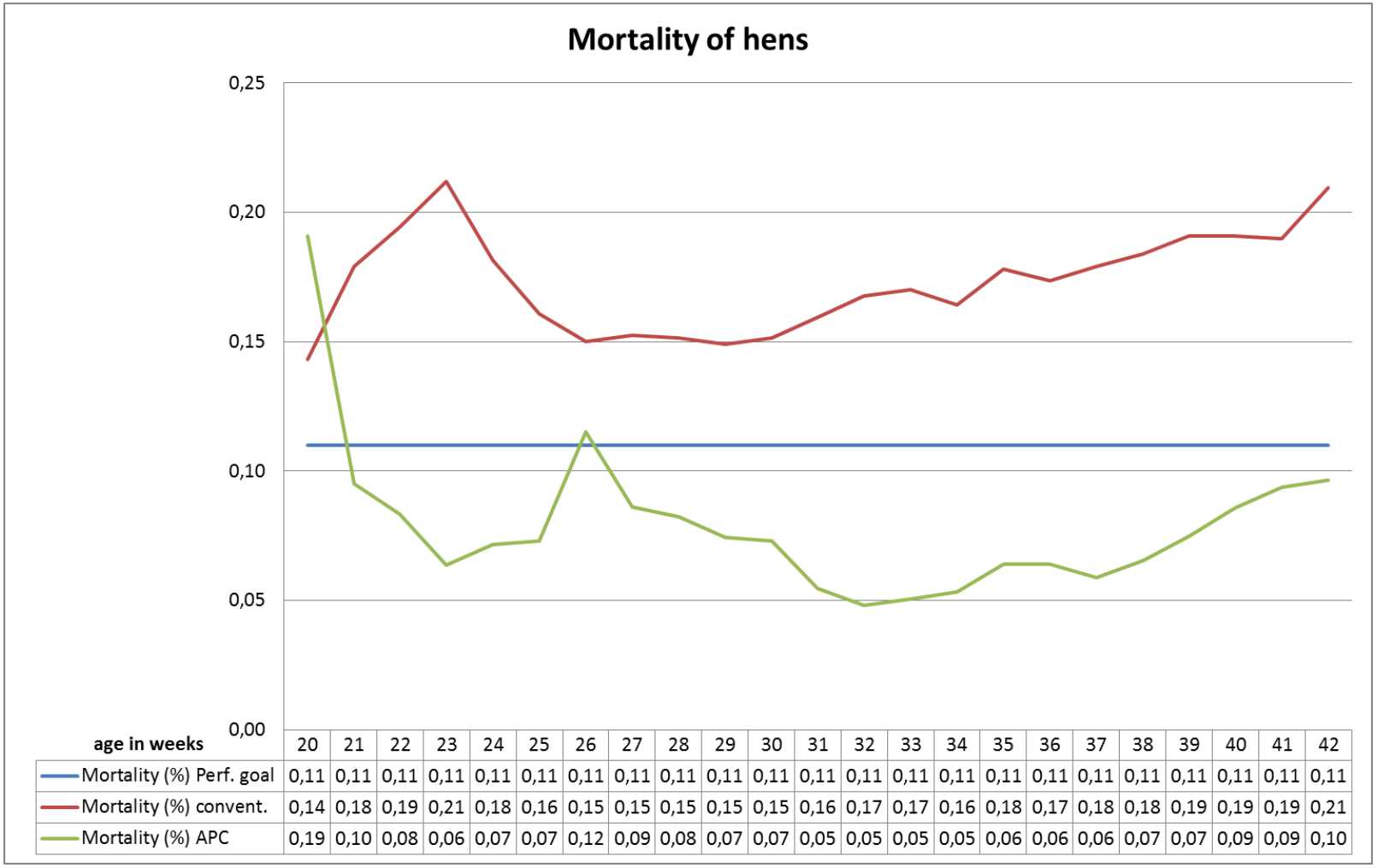
age in weeks	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Egg weight (g) Perf. goal	44,0	47,0	49,5	51,8	53,5	55,0	56,4	57,3	57,9	58,4	58,8	59,2	59,6	60,0	60,4	60,7	61,0	61,3	61,4	61,6	61,8	61,9	62,0
Egg weight (g) convent.	45,0	47,7	49,5	51,6	53,3	54,3	55,0	55,6	56,1	56,7	57,5	58,2	58,5	58,8	58,8	58,6	59,2	59,0	59,6	59,9	59,8	59,9	59,9
Egg weight (g) APC	44,2	47,1	50,0	52,7	54,1	56,0	57,4	58,5	58,9	59,3	59,8	60,3	60,6	60,8	61,4	61,7	61,6	61,4	61,7	62,1	62,2	62,3	62,5

Comparison data from Layer, Dubai



age in weeks	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Broken eggs (%) Perf. goal	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
Broken eggs (%) convent.	1,42	1,37	1,48	1,35	1,60	1,27	1,60	1,27	1,50	1,87	1,60	1,80	1,94	2,10	2,25	2,10	2,24	2,17	2,35	2,80	3,27	3,07	3,80
Broken eggs (%) APC	1,44	1,49	1,40	1,24	1,12	0,40	0,48	0,54	0,54	0,53	0,48	0,54	0,68	0,74	0,83	0,73	0,83	0,97	1,03	0,98	0,98	1,03	1,07

Comparison data from Layer, Dubai



age in weeks	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Mortality (%) Perf. goal	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11
Mortality (%) convent.	0,14	0,18	0,19	0,21	0,18	0,16	0,15	0,15	0,15	0,15	0,15	0,16	0,17	0,17	0,16	0,18	0,17	0,18	0,18	0,19	0,19	0,19	0,21
Mortality (%) APC	0,19	0,10	0,08	0,06	0,07	0,07	0,12	0,09	0,08	0,07	0,07	0,05	0,05	0,05	0,05	0,06	0,06	0,06	0,07	0,07	0,09	0,09	0,10

Comparison data from Layer, Dubai

Performance data of rearing Layer chicks with the innovative APC feeding system

Description:

The following results shows data from Layer chicks from a farm in the UAE fed with APC feeding concept.
The farm is producing with 300.000 laying hens and is rearing their own layer chicks, 100.000 at once.

Results with APC feeding concept:

100.000 layer chicks at once, genetic Lohmann
Data from 22.02.2012 with 14th life week

	Brown flock	White flock
Genetic performance goal:	1.171 g	1.072 g
actual weight in Ø:	**1.263 g**	**1.157 g**
% of higher weight:	8%	8%
Allocation of weight classes:		
Exact weight:	56%	53%
Above	40%	47%
Below	4%	0%
Uniformity in %	89%	88%

Results form Layer trial with APC UNI Nitra, Slovakia

Average results on egg shell and strength

The average results from the analyses from the egg shells shows no difference in content of Calcium and Phosphorous in the two groups,which shows a better absorption of minerals in the experiment group.

Tab. 1: Input of Calcium and Phosphorous in compound feed

	Control group	APC group	differences
Limestone	9,12%	8,00%	**-12,30%**
MCP	1,34%	0,76%	**-43,30%**

Tab. 2: Density of eggshell

Each 130 eggs	Control group		APC group	
	Shell brust (N)	Thickness of shell	Shell brust (N)	Thickness of shell
sample 30.05.2011	28,55	0,45	31,10	0,43
sample 25.06.2011	29,86	0,44	32,65	0,45
sample 17.08.2011	28,12	0,46	29,41	0,52
sample 12.10.2011	32,59	0,43	29,65	0,44
sample 24.11.2011	28,27	0,41	30,15	0,43
	Ø 29,48	**Ø 0,44**	**Ø 30,60**	**Ø 0,45**
		Ø plus	**3,80%**	**3,65%**

N and P reduction in the production with APC

Formulas for layers:

	conventional	**APC add.**
Crude protein	18% cp	14,0% cp
difference:		- 4,0% = minus 22%!
phosphorus	0,6% P	0,5% P
difference:		- 0,10 % = minus 16%!

necessary per hen: 43 kg feed/ year
reduced intake of protein: 1720 g RP
Calculated in N and P: 275 g N less per hen
43 g P less per hen

calculated production per year for: 40 Mio. layers

reduction from N per year: 11.000 t = 149.500 t Soya 46%
reduction from P per year: 1.720 t = 7.640 t MCP

APC natural feed additives for innovative poultry production

with clearly relief for the environment
producing for the today's request
being 10 years in front
with APC natural feed additives!