Effects of Nucleotide-Rich Yeast Extract (ASCOGEN) Supplementation on intestinal cells

Dr. Taylor, University of Glasgow / 1992

Effect of ASCOGEN (500 ppm) on the structure of the chicken intestine in 4 and 6 week old birds

After **4 weeks:** **19% fewer lesions in ASCOGEN fed chicken**

After **6 weeks:** **33% fewer lesions in ASCOGEN fed chicken**

Effect on intestinal morphology and performance of broiler chicks

University of Nottingham, UK

- **Performance Studies**
  - The performance trials were carried out under commercial conditions
  - 13,625 Ross as hatched broilers were placed per house.
  - ASCOGEN was included in commercial diets: day 1-14 at 1000 ppm day 15-28 at 500 ppm
- All the birds were fed the same diet from day 29 to slaughter on day 42.
- **Tissue Studies**
  - The histology development was assesses on six birds from each shed randomly selected on day 14 and day 28. The evaluation was done at the Nottingham University.
  - The following measurements were taken:
    - villi height
    - villi width
    - villi volume
    - crypt depth

Trials and Results… …in poultry

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Effect on villi height

Treatment	Period		Villi Height (cm)	Difference
Control	1	(day 1 -14)	0.53	
ASCOGEN	1		0.64	**20.70%**
Control	2	(day 15- 28)	0.84	
ASCOGEN	2		0.99	**17.90%**

Effect on crypt depth

Treatment	Period		Villi Height (cm)	Difference
Control	1	(day 1 -14)	0.155	
ASCOGEN	1		0.183	**18.10%**
Control	2	(day 15- 28)	0.224	
ASCOGEN	2		0.257	**14.70%**

No significant differences were found in villi width and volume

Effect on Performance

Weight kg

Day	1	7	14	21	28	42
ASCOGEN	0.04	0.13	0.35	0.66	1.10	2.41
Control	0.04	0.13	0.33	0.65	0.97	2.29
				Improvement		**+ 5.24%**

Mortality %

Day	1	7	14	21	28	42
ASCOGEN	0.14	0.62	0.85	1.30	1.90	2.70
Control	0.23	1.00	1.54	2.10	2.80	8.30
				Improvement		**-67.47%**

Reinforcement of the defence of chicken against coccidiosis

Dr. N. Hamet, CNEVA-PLOUFRAGAN, France

357 chicken were started at day 1 in two different rooms with cement floors.

2 groups were formed:
- the contaminated control group
- the contaminated group fed with ASCOGEN

The animals were killed at the age of 42 days.

The floor of the rooms were contaminated with:

112 000 000 sporulated oocysts of Eimeria acervulina per m^2
and
16 800 000 sporulated oocysts of E. tenella per m^2.

Lesions - Excretion of Oocysts

Group	1st Trial		2nd Trial	
	Control	Test Group	Control	Test Group
% Lesions*		**- 20 %**		**- 33 %**
E. Of O.**	1'977'000	1'091'000	1'319'000	1'132'000
% Decrease		**- 45 %**		**+ 14 %**

* = Lesions expressed in number of animals with lesions

** = Excretion of oocysts in number of oocysts per gram faeces

Control: contaminated control group
Treatment : contaminated group fed with ASCOGEN

The Toxin Neutralizing Effect in Breeding Stocks and Young Duck Stocks

Dr. Bajusz Istvan, Munkàs-Paraszt Mg Tsz, Dusnok, Hungary

Effect of nucleotides in breeding stock

The normal performance of Mullard ducks in Hungary is under toxin free conditions:

laying rate: **75 - 80%**
hatchability: **~ 40%**

In the present trial the breeding stocks the rate of lay was 81% and the hatchability 39.9%.

Laying rate and hatchability of ducks fed with feed containing mycotoxins

Period	Laying rate (%)	Hatchability (%)	Remarks
October	81	39.9	Normal feed
November	69	36.4	Toxin in feed (DON, DAS, T2)
December	60	29.2	!! Toxin in feed !!
January	52	26.1	!! Toxin in feed !!
February	64	29.4	**Inclusion of ASCOGEN, still toxin in feed**
March	69	37.2	!! Toxin in feed !!
April	74	38.2	!! Toxin in feed !!
May	75	38.3	Normal performance

Effect of ASCOGEN on young duck stocks

2 groups of 10'000 birds each were established. The day old birds came from the parents either with or without ASCOGEN

In the first group cramming lasted for 14 days, the ducks were not treated with nucleotides.

The group 2 (10000 ducks) were fed ASCOGEN from the first day of life. The mycotoxins T2, DAS and DON were present in the feed.

Trials and Results… …in poultry

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	Average over 5 years	Toxins during 3 months	Toxins plus ASCOGEN-feeding from day 1
Ave. body weight (kg)	3.33	3.00	3.45
Rearing period (days)	100	111	99
Feed conversion	4.86	6.48	4.67
Mortality (%)	4.20	12.10	4.10
Liver weight (g)	300	**110**	**320**

Summary:

The application of ASCOGEN protects the immune system of the ducks from harmful effects of mycotoxins (DON, DAS and T2) and if ASCOGEN is administered as recommended by the manufacturer the negative effects of mycotoxins are neutralized.

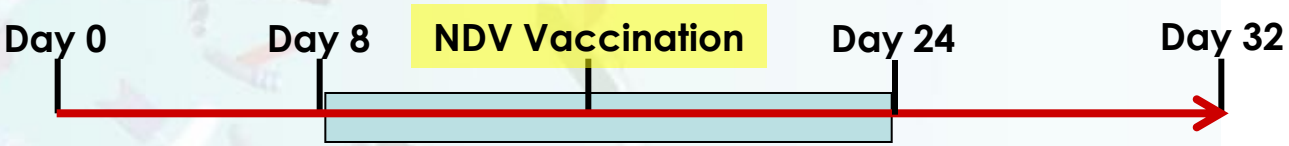
Vaccination of Chicken against Newcastle Disease Virus

Dr. Ramadan

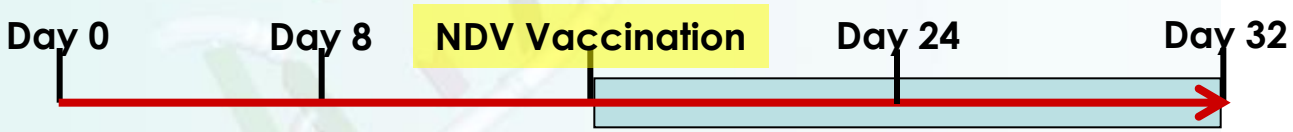
For the trial 3 groups of 50 one day old male Hubbard chicks were used

Group 1: **without ASCOGEN**

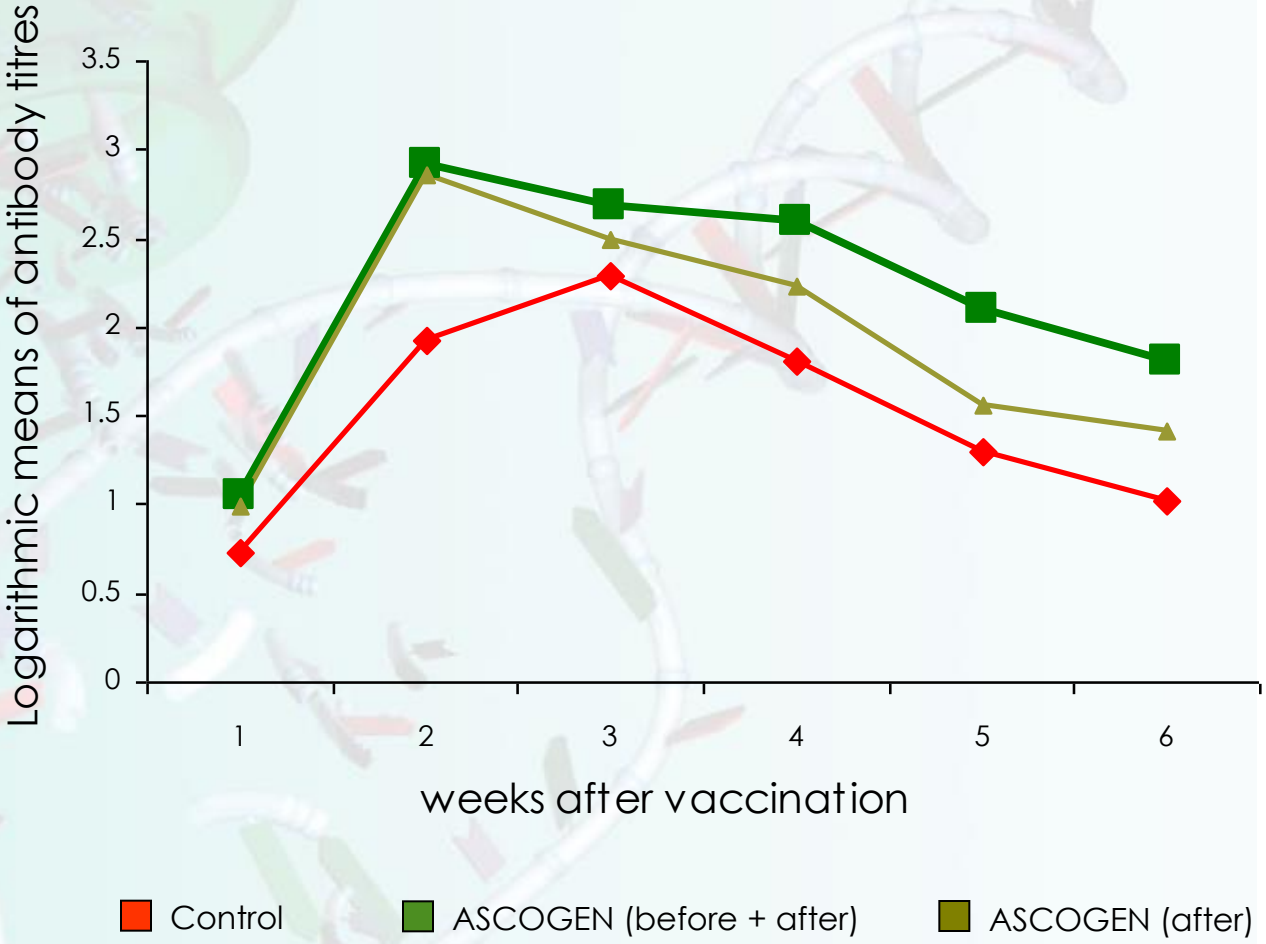
Group 2: **with 500ppm ASCOGEN**, one week **before** till one week **after** vaccination

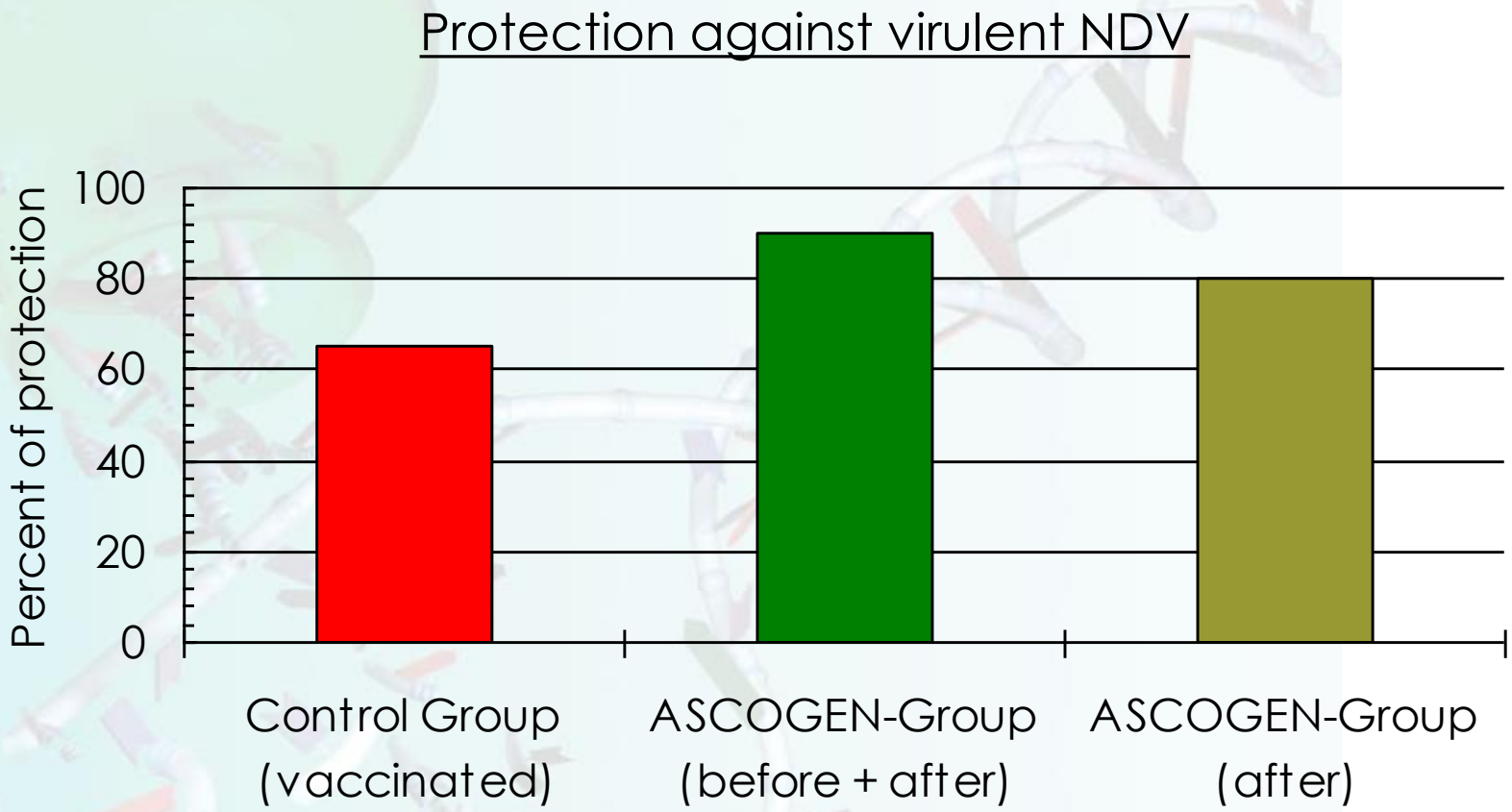


Group 3: **with 500ppm ASCOGEN**, **after** vaccination for 2 weeks



Course of antibody development after vaccination against NDV





Trial on broiler breeders

UK

Animals

- 24'000 broiler breeder were housed in four identical houses and fed the same feed.

Supplementation

- The supplementation of ASCOGEN (500 g/per ton) started at week 9.

Diseases

- In the 14th to 15th week: outbreak of **coccidiosis**
- In the 17th to 18th week: infection with an **IB variant**
- In the 22nd week: an acute **Marek** infection

Trials and Results… …in poultry

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Results until week 50:

	Control group	ASCOGEN-group	Difference
Number of birds	12'000	12'000	
Mortality	17.02%	5,52%	**-11.5**
Eggs/Hen (HH)	134.1	152.6	**+18.8**
Chicks/Hen (HH)	104.5	116.6	**+12.0**

Trial on Performance of breeding hens

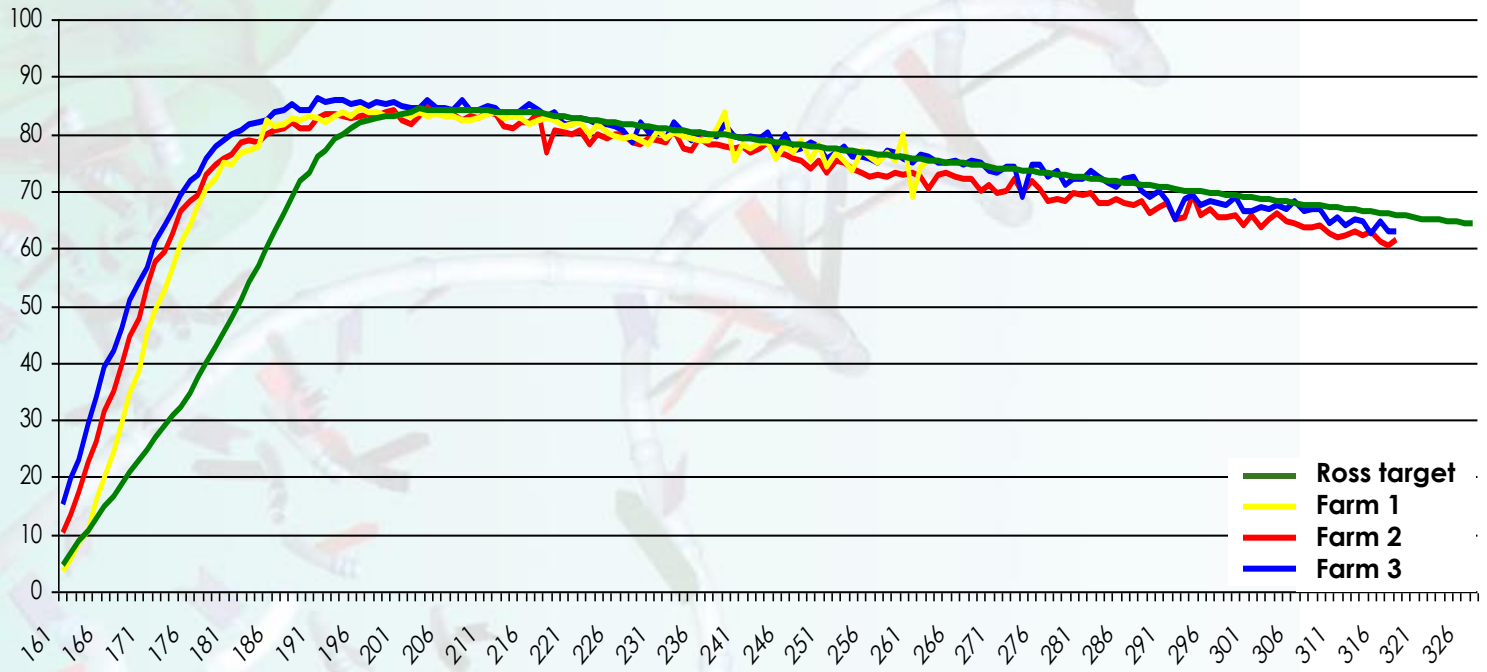
Finland

We have performed several trials to check,

what performance is possible under normal farm conditions.

Trial with Ross 308 breeder hens on three commercial farms

Productivity

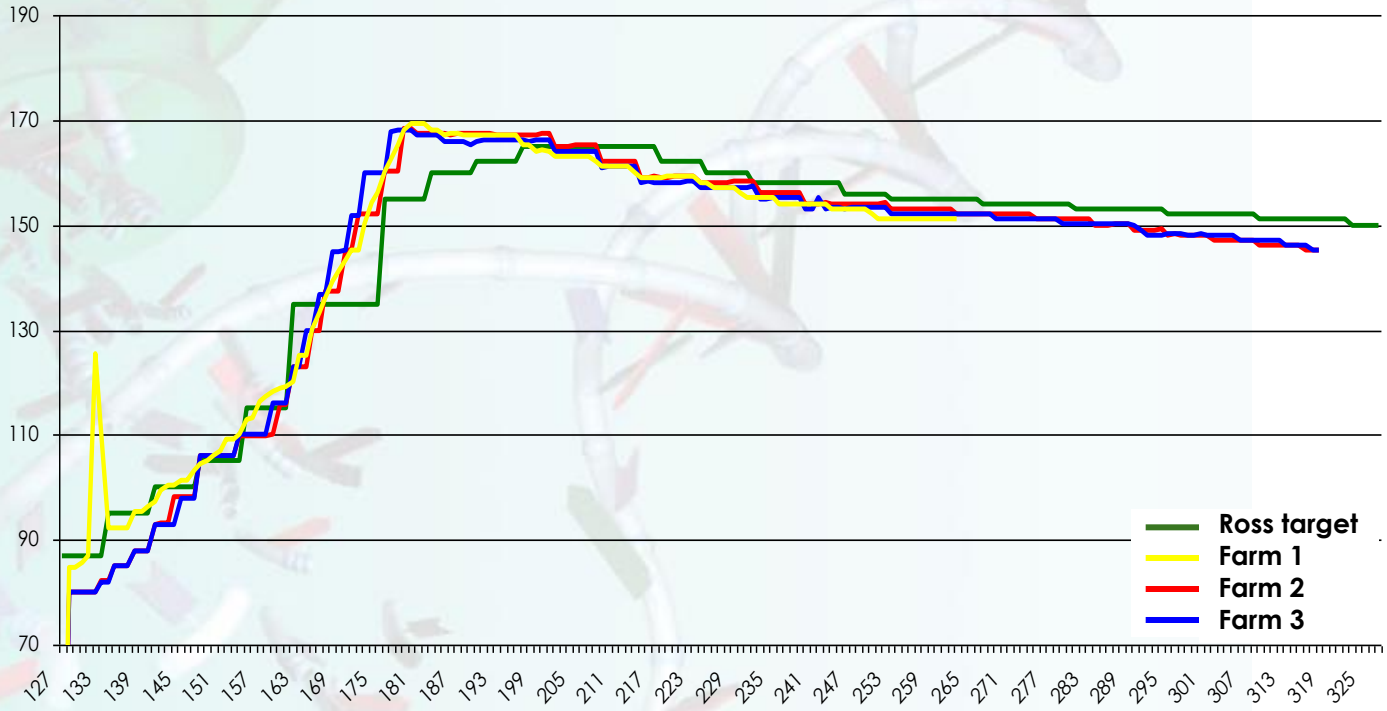


- more rapid increase of the productivity in all trials compared to the ideal value given by Ross
- simultaneously the feed consumption was reduced
- 10 additional hatching eggs per hen up to week 30

Trials and Results… …in poultry

ASCOGEN®

Feed

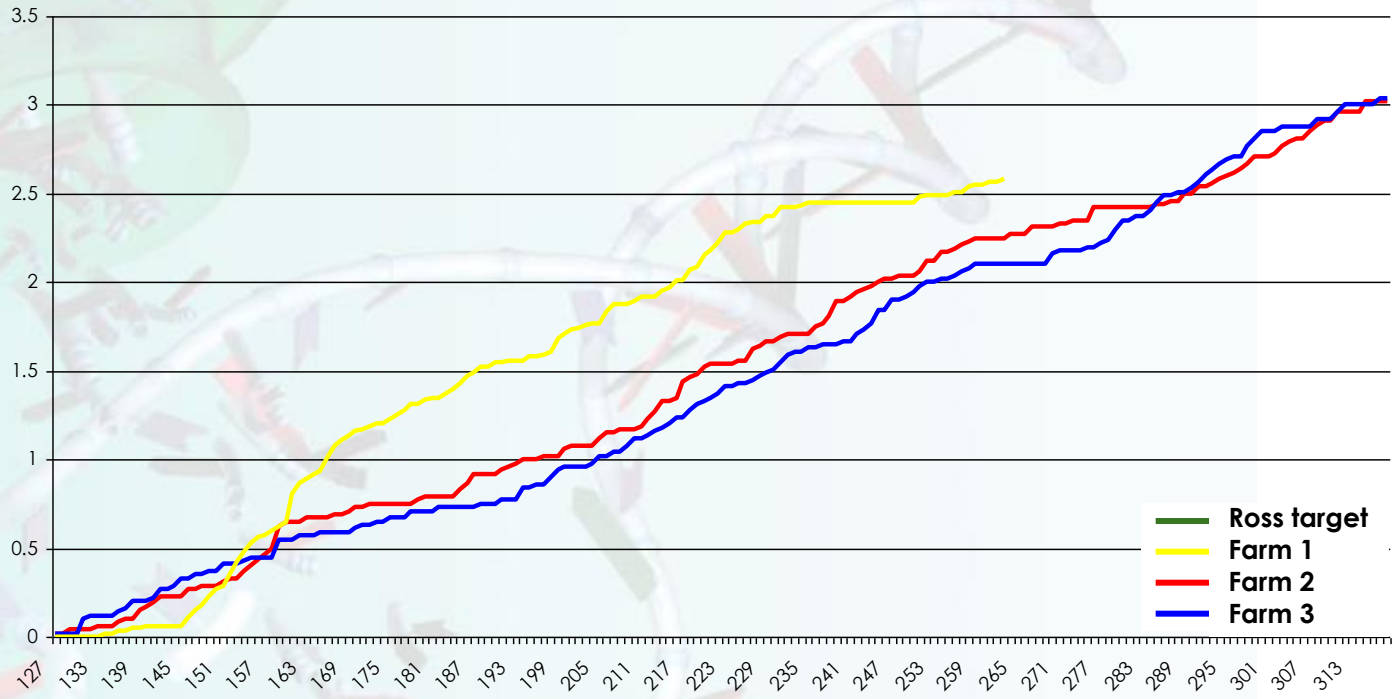


- The feeding was adapted to the needs of the hens
- After the laying peak the feed intake was 5% lower than recommended
- Less feed due to a better development of the intestinal villi

Weight

- Despite a lower feeding the weight of the hens was too high
- The feed intake can even be more reduced
- The feed supply can even be more reduced

Mortality



- the value for mortality given by Ross is 7%
- (in almost all farms it is much higher than that)
- drastically reduced mortality when feeding ASCOGEN

Broiler breeder trial

Sweden

15.400 Ross 308 broiler breeders

Arrived from an other farm at week 20 in poor condition and a wide variation in weight

Uniformity at arrival: 52%

Broiler breeder ration using 0,5 kg per ton ASCOGEN starting at day 161 (23 weeks)

Broiler breeder trial

Italy

Effect of ASCOGEN on broiler-breeders in the largest integrated production company in Italy.

Two groups of COBB-broiler-breeders were housed on two different farms.

The animals received identical feed. The feed of the trial group was supplemented with 0.5 kg ASCOGEN per ton.

Start of the trial:	week 36/37
End of the trial:	week 64
Immunity:	good protection in both groups after vaccination
Antibody titres:	no significant difference in both groups

Trials and Results… …in poultry

ASCOGEN®

	Control group	Test group
Number of hens	21'600	16'000
Mortality	12%	12%
Results:		
Hatching eggs		**+ 8.97**
Chicks/hens (8.97 x 82 % average hatch)		**+ 7.35**
Additional profit per one chick		0.294 Euro
Total additional gain per hen		**+ 2.164 Euro**

Highly improved and more persistent hatching egg production in the trial group

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Trial on grand-parent animals

Slovenia

ASCOGEN from day 1 till end of production in a dosage of 500g/ton of feed.

Rearing period:

	Control	ASCOGEN	Difference
Number of housed animals	21'400 hens	21'850 hens 6'700 cocks	
Mortality until day 115	6.64%	5.12%	**- 1.52%**
Uniformity until day 115	72.46%	86.30%	**+ 13.84%**
Antibody titre to NDV (Day 115)	23.52	52.56	**+ 28.84**
Antibody titre to NDV (Week 26)	32.32	65.8	**+ 33.48**
Animals reaching production age	91.19%	95.97%	**+ 4.78%**

Production period: (up to week 63)

	Control	ASCOGEN	Difference
Mortality	14.15%	12.90%	**- 1.25%**
Egg production per hen	152.02	156.98	**+ 4.96**
Hatching eggs per hen	131.18	141.42	**+ 10.24**
% hatching rate	78.22%	79.75%	**+ 1.53%**
One-day old chicks per hen	**102.62**	**112.92**	**+ 10.2**

Effect on broiler breeders

France

Two groups of Ross Broiler-breeders (2 x 7'500) were compared.

ASCOGEN was fed from week 10 till the end of the laying period at week 64.

Results:

	Control	ASCOGEN	Improvement
Egg-production till week 64	162.16	164.28	**2.12**
Production of hatching eggs	152.96	156.40	**3.44**
Feed consumption per chick produced	454 g	447 g	**- 7 g**
Chicks per hen	116.6	124.39	**7.79**

Trials and Results… …in poultry

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The results show:

- 2.12 more eggs per hen (housed)
- 3.44 more hatching eggs per hen (housed)
- 7.79 more chicks per hen (housed)
- 7 g less feed consumption per chick produced

Improved antibody titres at week 34:

Newcastle	**+ 41.0 %**
IB	**+ 37.5 %**
Gumboro	**+ 1.5 %**
Encephalo	**+ 15.0 %**

Trial on broiler breeders

UK

Effect on Broiler Breeders with the UK's largest integrated poultry producers.

Start of the trial at 24. May 1993 with one day old chicks till the end of lay. The birds were moved to the laying farm at 15 weeks of age.

Stock used was Ross 1 broiler parents.

The control and ASCOGEN group each had 18,820 day old females and approximately 2500 males.

The following parameters were monitored:

Mortality rate
Laying performance
Egg production
Hatchability
Chick Numbers

Breeder Flock performance (at week 55):

	Control	ASCOGEN	Difference
Cumulative Laying Rate (H/H)	130.43	135.3	**+ 3.7%**
Mortality	9.54	6.16	**- 35,4%**
Cumulative Hatch	83.00	84.91	**+ 2.3%**
Cumulative CHICKS/HEN	99.91	104.70	**+ 4.8%**

ASCOGEN supplemented breeders produced **4.8 more day old chicks** per hen in just 29 weeks.

Antibody titre levels:

The ASCOGEN group showed a **10% increase** in titre levels. The birds were better protected against disease challenges, which explains the much lower mortality in the ASCOGEN group.

Effect of ASCOGEN on growth of chicken

Switzerland

Feeding: 2000 Ross one-day old chicks were fed with a normal commercial feed

Application of ASCOGEN:

Starter feed:	Day 1 till day 7:	1 kg ASCOGEN/ton
Grower feed:	Day 8 till day 34:	0.5 kg ASCOGEN/ton
Finisher feed:	Day 35 till day 41:	0 kg ASCOGEN/ton

Results:

	Daily Feed intake (g)	End weight (kg)	FCR	Mortality (%)
Control	101.7	2291	1.852	1.4
ASCOGEN	99.4	2308	1.797	0.7
Difference	**- 2.3%**	**+ 0.8%**	**-0.055**	**- 50%**

	Production index
Control	292
ASCOGEN	**305**

Effect of addition of ASCOGEN on meat-type chicken

Perdigão Agroindustrial S.A., Brotas, SP, Brazil

Objective: To verify the zootechnical indexes of male meat-type Cobb chickens when subjected to feed with ASCOGEN

Evaluation dates: Beginning: 25 weeks old.
End: 50 weeks old.

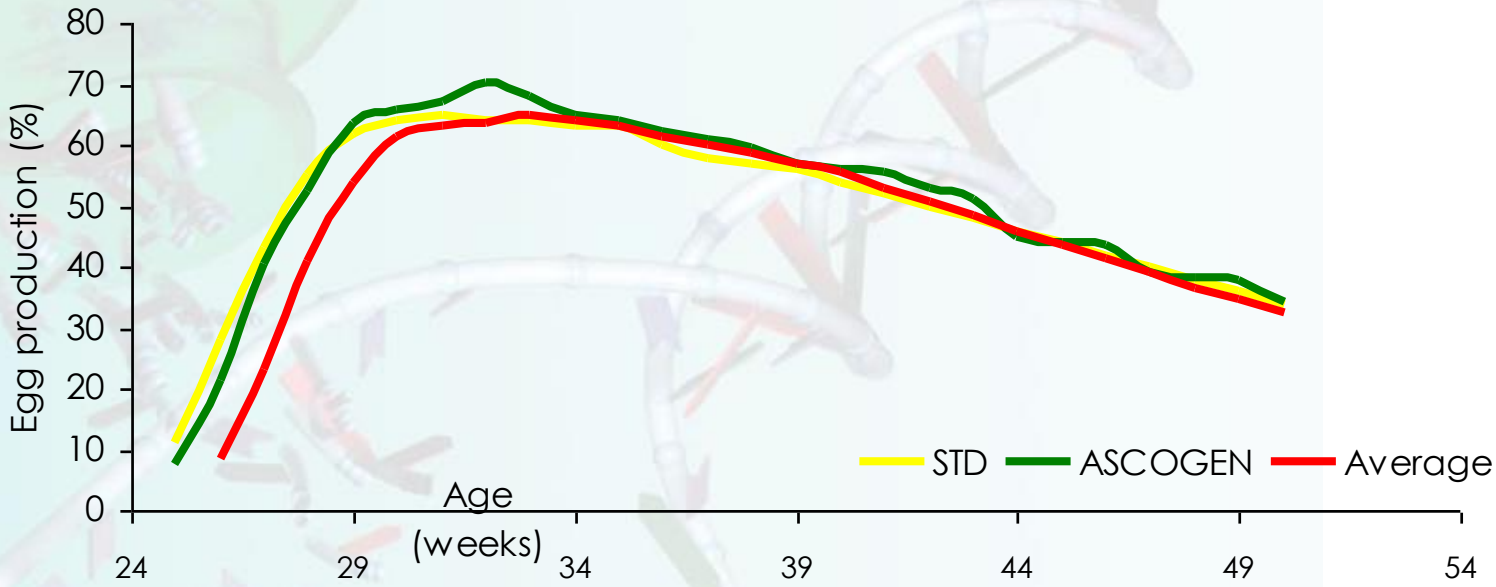
Trial conditions:

- 3000 male meat-type chickens (Grand parent stock)
- Dose: 0,5 kg of ASCOGEN/ ton of feed (from week 40 to 44 no ASCOGEN in the feed)

Variables:

- Egg production;
- Hatching of eggs;
- Viability of the eggs;
- Not usable eggs
- Mortality;
- Viability of the batch

Egg production



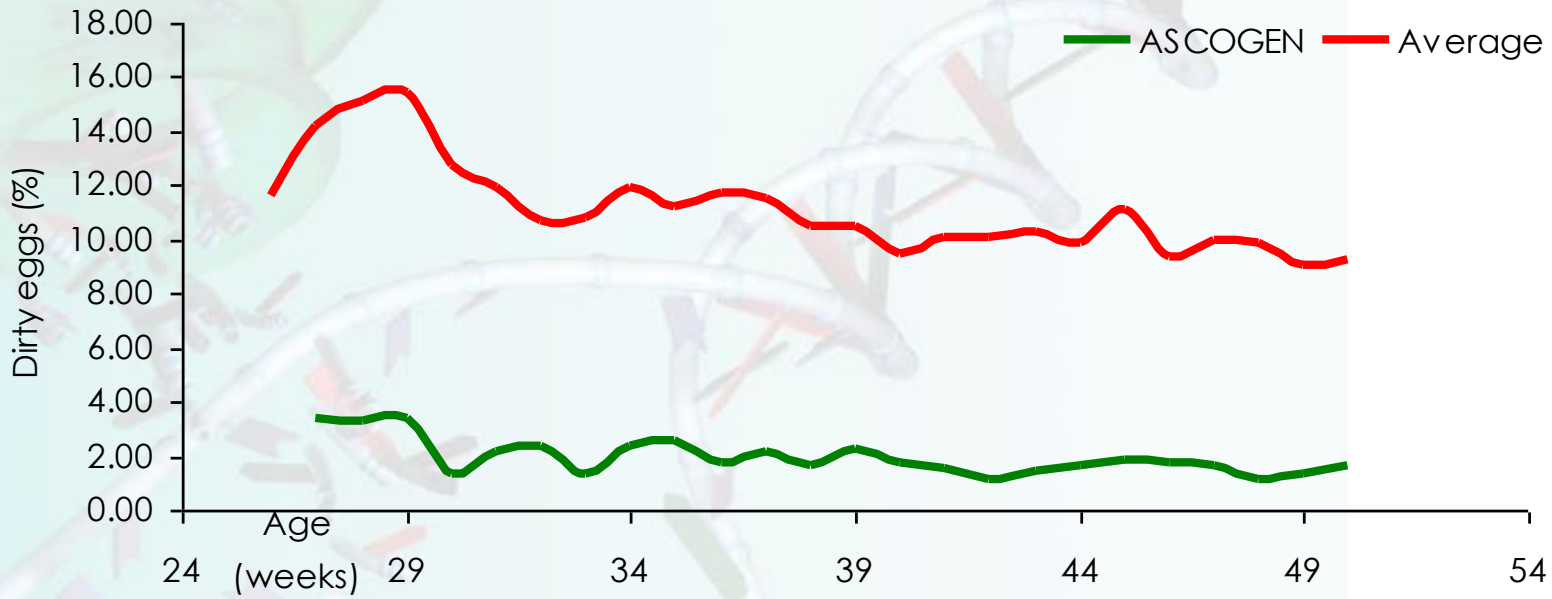
Average difference in egg production at the age of 40 weeks

Variable	ASCOGEN	Avg previous batches	Difference
Egg production	55.084%	49.889%	**+ 5.195%**

Average difference in egg production at the age of 50 weeks

Egg production	50.88%	47.09%	**+ 3.79%**

Dirty Eggs

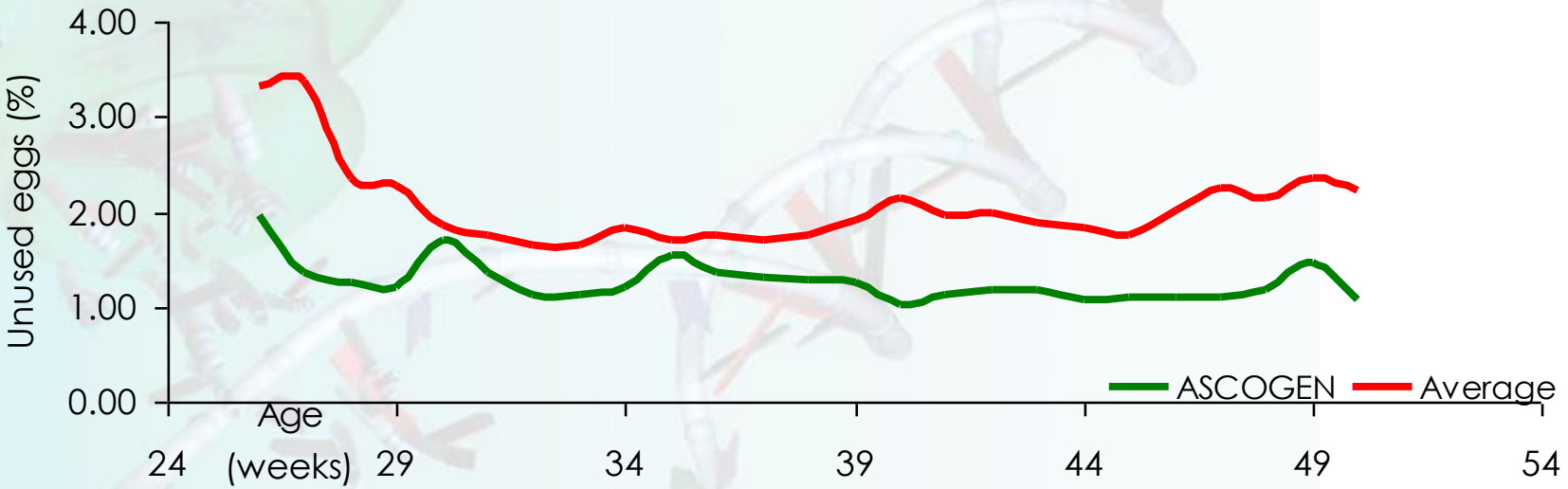


Average difference of the dirty eggs at the age of 50 weeks

Variable	ASCOGEN	Avg previous batches	Difference
Dirty Eggs	1.80 %	10.32 %	**- 8.32 %**

Trials and Results… …in poultry

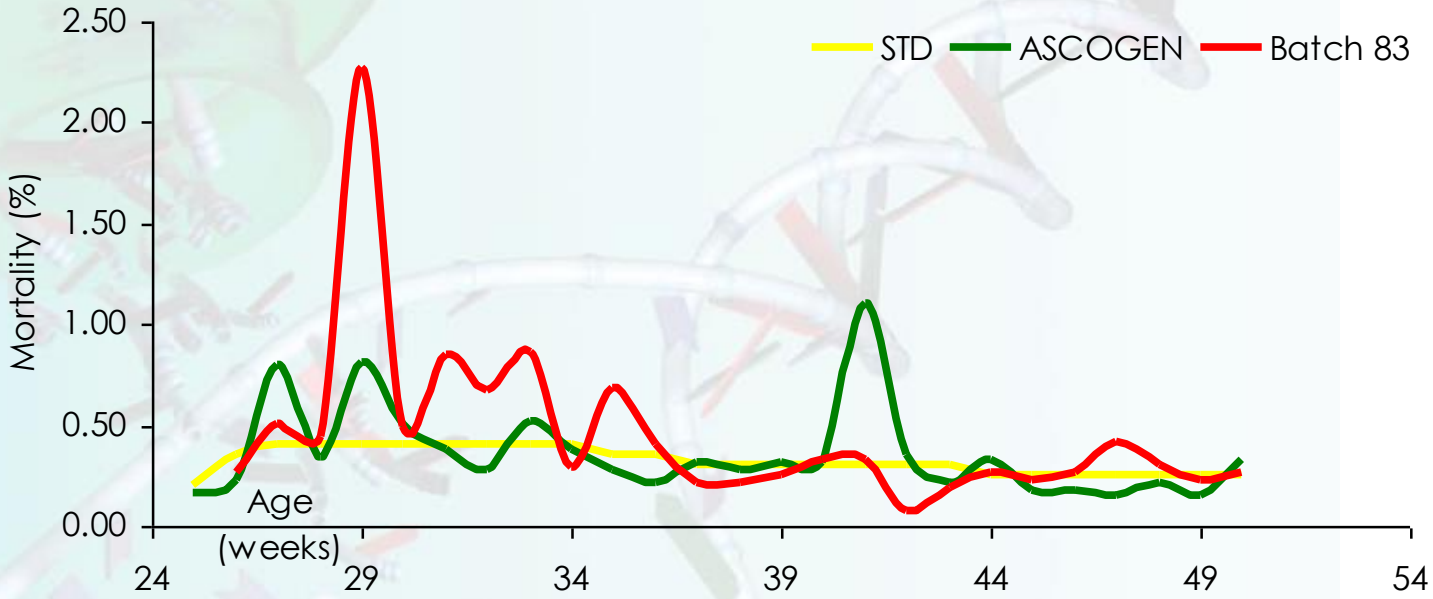
Unused Eggs



Average difference of the unused eggs at the age of 50 weeks

Variable	ASCOGEN	Avg previous batches	Difference
Unused Eggs	1.21 %	1.98 %	**- 0.770 %**

Mortality



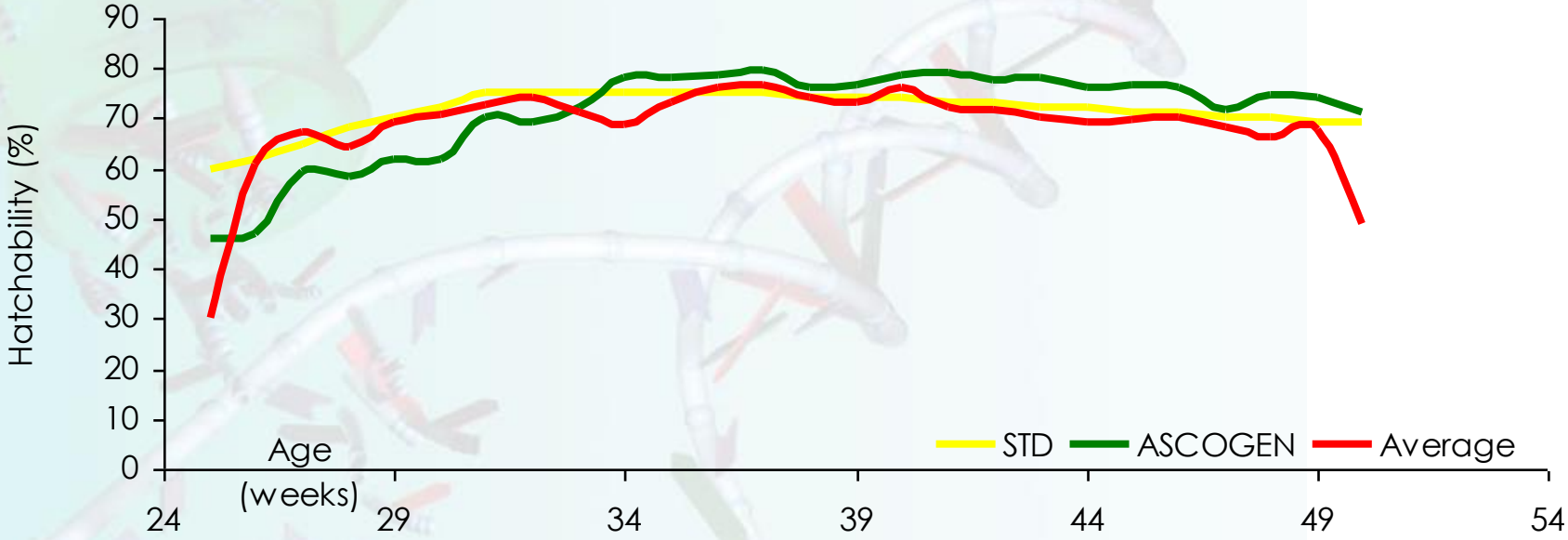
Average difference in percentage of mortality at the age of 40 weeks

Variable	ASCOGEN	Avg previous batches	Difference
Mortality	0.353 %	0.549 %	**- 0.196 %**

Average difference in percentage of mortality at the age of 50 weeks

Mortality	0.36 %	0.44 %	**- 0.080 %**

Hatchability



Average difference in percentage of hatchability at the age of 40 weeks

Variable	ASCOGEN	Avg previous batches	Difference
Hatchability	71.50 %	68.747 %	**+ 2.753 %**

Average difference in percentage of hatchability at the age of 50 weeks

Hatchability	71.06 %	68.27 %	**+ 2.79 %**

Effect of addition of ASCOGEN in broiler

Granja São José, Amparo – SP Brazil

Objective: To verify the zootechnical effects of ASCOGEN in starter feed of low weight broiler chicks

Evaluation dates: Beginning: day old
End: after 10 days (performance control till slaughter)

Trial conditions: 14.150 broilers/ treatment (18 birds/m^2)
Dosage: 0,5 kg of ASCOGEN / ton of feed
Breed: Cobb Fast
4.000 kg starter feed per treatment

Variables:

- Weight
- Mortality
- Intestinal villi

Trials and Results… …in poultry

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Length of villi (µm)

Age	ASCOGEN	Control	Difference
10 days	170.626 ± 0.270	121.594 ± 0.276	**+ 40.32%**
14 days	179.179 ± 0.106	170.030 ± 0.160	**+ 5.37%**

Circumference (mm)

Age	ASCOGEN	Control	Difference
10 days	23.18 ± 3.65	15.62 ± 3.72	**+ 48.39%**
14 days	24.88 ± 5.57	24.96 ± 5.10	**0.00%**

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Differences in weight

Age	ASCOGEN	Control	Difference
10 days	185.9 g	171.3 g	**+ 8.52%**
22 days	716.7 g	681.4 g	**+ 5.18%**
35 days	1620 g	1570.0 g	**+ 3.18%**
44 days	2368 g	2178 g	**+ 8.72%**

In this trial no change in the mortality became obvious

Effect of addition of ASCOGEN in broiler breeders

The Netherlands

Objective: To verify the improvement of the health status and reduce the costs of mortality, downgrading and deterioration in health in all stages of broiler breeders

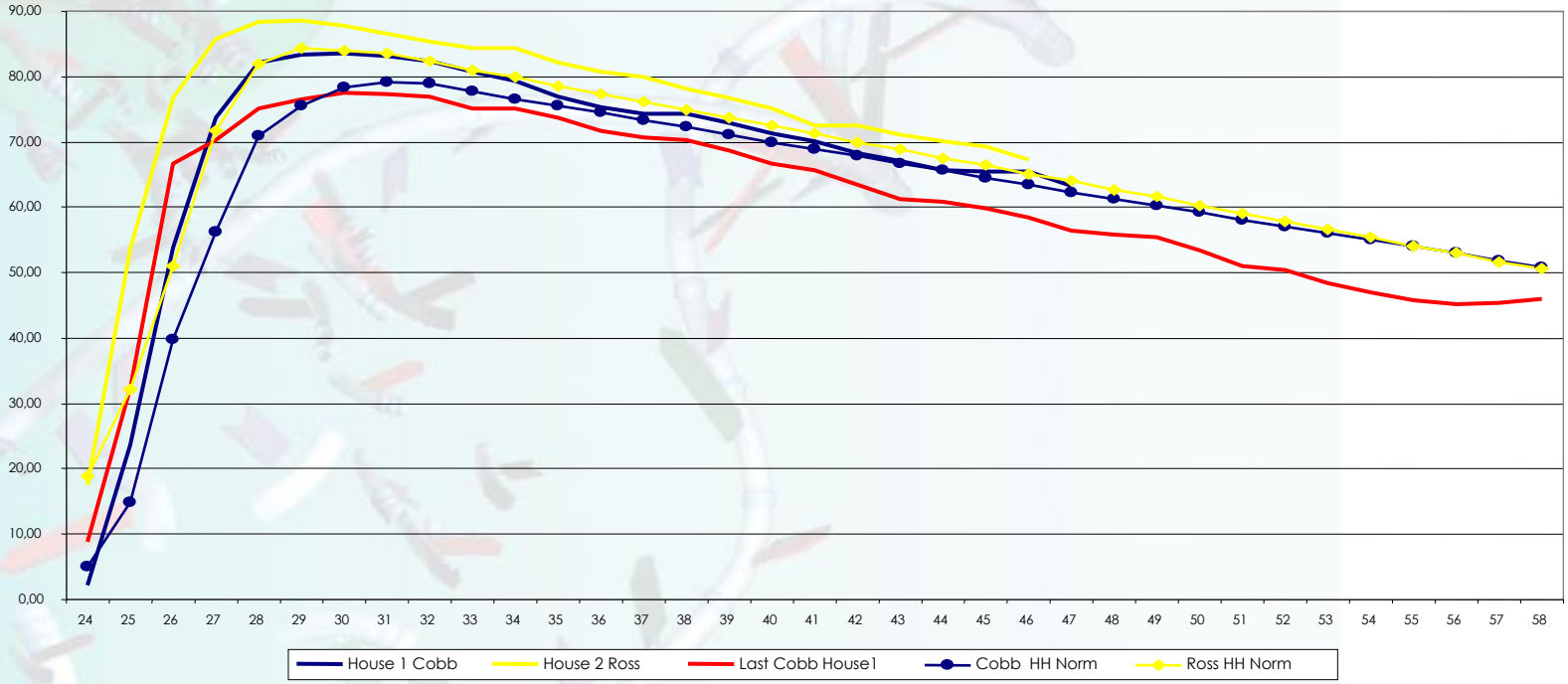
Trial conditions: 8500 Ross 308 and 8500 Cobb 500
Dosage: 1.0 kg of ASCOGEN / ton of feed for 4 weeks during rearing
500 g of ASCOGEN / ton of feed till the end of the experiment

Challenges:

- Lameness ➔ synovitis, wounds at feed, toes and joints
- bacterial infection ➔ peritonitis, pneumonia, pericarditis, perihepatitis
- worm infestations (ascaridia)
- digestive problems
- fatty liver
- increased mortality, reduced performance, bad chick quality

Improving poultry chain immune status

Ascogen from age 8 weeks in rearing.
House 1 Cobb and House 2 Ross compared to last Cobb flock in House 1, the Cobb and the Ross hen Housed Norm.



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Effects of ASCOGEN in the development of the intestinal tract

Trial in Peru

		Duodenum		***Ileum***
Farm 1 (***without treatment***) (day 24) ***Average***	***38.5***		***33.5***	
Farm 2 (***with treatment***) (day 23) ***Average***	***56.5***		***47.5***	
Increase by ASCOGEN	***+22%***		***+29%***	

The photographs were taken with a magnification of 2.5X