Effects of post-hatch fast of chick on digestive tract development and growth performance according to diet and rearing environmental conditions

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Context

In commercial conditions, chicks underwent a post-hatch fast (PHF) between 24 and 72h, and about 24h when hatchery and farm are in the same region. Effects on digestive tract (DT) development and animal growth are controversial due to several factors such as definition of bird age (from hatching in most studies, or from farm arrival), animal genetics, or dietary and environmental conditions (DEC).

Materials and methods

The effect of PHF was studied on body weight (BW) and DT development of Ross PM3, during a first experiment (48h fast), with age of birds determined as the age at farm arrival with access to feed and water. To study the effect of DEC, birds were reared either in optimal DEC, or damaged DEC (low quality diet and/or low quality rearing environment) in a 2x2x2 factorial design (6 pens/treatment ; 54 birds/pen of 2.3 m^2 of useful area). In a second experiment, the effect of a shorter PHF (24h) was studied on chick BW and DT development.

Results

PHF : post-hatch fast / DF : direct fed

First experiment : 48h post-hatch fast

At the farm arrival
(14 birds / treatment)

PHF chicks / DF chicks

BW : ↘ 3.5 g (8 %)
Yolk sac (YS) : ↘ (2.0 vs 5.1 g)
BW without YS : similar

The relative weight of the segments of the DT (relative to BW without YS)

Proventriculus : ↗ 37 %
Gizzard : ↗ 33 %
Small intestine : ↗ 27 %
Caeca : ↗ 79 %

Effects of post-hatch fast according to dietary and environmental conditions (DEC)
2x2x2 factorial design (6 pens/treatment; 54 birds/pen)

In optimal DEC

PHF chicks / DF chicks

BW (3 weeks) : ↗ 5 %
BW (5 weeks) : ↗ 3.5 %

In damaged DEC : low quality diet and rearing environment

Higher negative effect of DEC on BW in PHF chicks than in DF chickens

	PHF chicks	DF chicks
BW (3 weeks)	↘ 12 %	↘ 10.5 %
BW (5 weeks)	↘ 16 %	↘ 10 %

Footpad dermatitis : ↗ in PHF chickens at 3 weeks but no difference at 5 weeks

Second experiment : 24h post-hatch fast

Effect of post-hatch fast
(11 birds / treatment)

PHF chicks / DF chicks

BW : ↘ 2.6 g (6 %)
Yolk sac (YS) : ↘ (3.2 vs 6.0 g)
BW without YS : similar

The relative weight of the segments of the DT (relative to BW without YS)

Proventriculus : ↗ 21 %
Gizzard : ↗ 25 %
Small intestine : ↗ 23 %
Caeca : x 2,75

Conclusion

PHF (24 or 48h) has a positive effect on the chick DT development. These PHF seem beneficial on bird growth in optimal, but not in damaged DEC. This period of live needs to be managed according to DEC.