

**Nutritional approaches to arresting
the decline in fertility of
pigs and poultry**



**edited by:
J.A. Taylor-Pickard
L. Nollet**

Contents

Nutrigenomics in pig and poultry production: Feeding the genes for fertility	13
<i>Karl A. Dawson</i>	
1. Introduction	13
2. Using genomic information to understand fertility	13
3. Oligonucleotide microarrays as a tool for examining gene regulation in swine	15
4. Examining fertility issues using gene expression	18
5. Nutrigenomics	18
6. Effects of selenium on gene expression	19
7. Vision of the future	22
References	23
Recent advances in sow reproductive function	25
<i>Merlin Lindemann and B. G. Kim</i>	
1. Introduction	25
2. A perspective on sow nutritional requirement estimates	26
3. A case in point - copper	30
4. Feeding management	31
5. Conclusion	34
References	34
Organic or inorganic selenium for hyperovulatory first-parity sows? Antioxidant status, hormonal response, embryo development and reproductive performance	35
<i>Marie-Ève Fortier and J. Jacques Matte</i>	
1. Introduction	35
2. Long-term effects on selenium-related metabolites	38
3. Short-term effects on selenium-related metabolites and hormone status during the peri-oestral period (canulated animals)	42
4. Reproduction performance on day 30 of gestation	44
5. Conclusion	48
Acknowledgments	49
References	50

Contents

Piglets survival: importance for efficient productivity	53
<i>Jean Le Dividich and John Rooke</i>	
1. Introduction	53
2. Peri-natal mortality	53
3. Understanding piglet mortality	55
4. Importance of colostrum for the piglet's survival	57
5. Concluding remarks	65
References	65
Nutritional management of reproduction	73
<i>David Henman</i>	
1. Introduction	73
2. Where are we and what do we aim at?	74
3. Targets for gilt preparation	76
4. Gestation feeding	78
5. Lactation feeding	82
6. Longevity	84
7. Mineral needs for reproduction	87
8. Current thinking on organic minerals	89
References	89
Further reading	90
The role of the boar in maximising reproduction: effects of nutrition and management	93
<i>W.H. Close</i>	
1. Introduction	93
2. Reproduction in the boar	93
3. The rearing period	94
4. Nutrition of the breeding boar	95
5. Mineral and vitamin requirements	100
6. Feed quality	106
7. Water requirement	107
8. Effects of environmental temperature	108
9. The effects of stockmanship	110
10. Conclusions	111
References	112

Recent developments of fertility in turkeys	117
<i>Jean-Pierre Brillard</i>	
1. Introduction	117
2. Environmental conditions to sustain fertility in breeder flocks	117
3. Accessing and preserving sperm with a high fertilizing potential	119
4. Sperm-egg interactions: an <i>in vitro</i> approach to better assess fertility <i>in vivo</i>	123
5. Conclusion	123
References	124
Examining the impact of nutrition on the fertility of broiler breeders	127
<i>Robert A. Renema and Frank E. Robinson</i>	
1. Growth selection and reproduction in broiler breeders	127
2. Reproduction in the broiler breeder	128
3. Fertility	129
4. Factors affecting egg size and	130
5. Impact of hatching egg quality on hatchability	132
6. Optimizing nutrition for the hatching egg	134
7. Maintaining male fertility	136
8. Study of selenium source in broiler breeders	137
9. Conclusions	141
References	142
Broiler breeder nutrition and management: What's new?	147
<i>Rob Gous</i>	
1. Introduction	147
2. Management of breeders during the rearing period	148
3. The effect of constant and changing daylengths on age at maturity	149
4. Lighting treatments in the laying period	155
5. Crystalline amino acid usage in broiler breeders	158
6. Calcium intake in the rearing period and shell quality	159
7. Concluding remarks	159
References	160

Contents

Nutrition of the newly hatched chick: An opportunity to maximize broiler performance?	163
<i>Yael Noy</i>	
1. Introduction	163
2. Yolk utilization	163
3. Gastro-intestinal development	165
4. Functional development	167
5. Small intestinal absorption	169
6. Effect of early access to feed	170
7. Conclusions	172
References	173
Striving for a feed conversion ratio of 1.00 - The challenges we need to overcome	177
<i>Park W. Waldroup</i>	
1. Development of the poultry industry	177
2. What does the future hold?	178
3. The four factors to work on	178
4. Conclusion	183
References	184
Keyword index	187