



Global Poultry Mineral Guide

Trace Mineral Feeding Recommendations



Wellbeing Isn't One Thing. **It's Everything.**



The Zinpro® Global Poultry Mineral Guide is an interactive document compiling trace mineral recommendations to help your operation address different challenges.

In addition to being able to find recommendations for your individual targets, you may also use the general recommendations session.

Based on many scientific studies, Zinpro® is confident to recommend total replacement with Zinpro® Performance Minerals®. To provide different solutions, in this guide there are recommended rates for Zinpro Performance Minerals or inorganic minerals.

This guide allows you to search your preferred recommendation by species or phase of production:

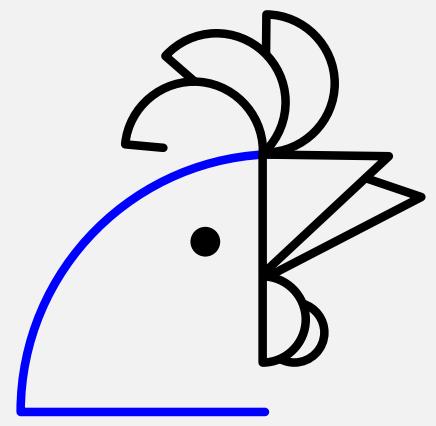
- [Broilers](#)
- [Breeders](#)
- [Layers](#)
- [Turkeys](#)
- [Turkey Breeders](#)

For more information, and meet different objectives of your production system and business **contact a Zinpro expert at [zinpro.com](#)**



BROILERS

- **Zinpro General Recommendations:
Performance, Carcass Quality and FPD**
- **Antibiotic-Free Diet**
- **Breast Myopathies/Meat Quality**
- **Food Safety**
- **Infectious Diseases Challenges**
- **Sustainability**
- **Genetic Breeder Lines**



BROILERS

Zinpro General Recommendations: Performance, Carcass Quality and FPD*

BROILERS

Zinpro General Recommendations: Performance, Carcass Quality and FPD

Antibiotic-Free Diet

Breast Myopathies/Meat Quality

Food Safety

Infectious Diseases Challenges

Sustainability

Genetic Breeder Lines

BREEDERS

LAYERS

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3}

Broilers	(0-10 days) Starter			(11-24 days) Grower			(25 days to end) Finisher		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	100	40	60	100	40	60	90	40	50
	(90-110)	(40-60)	(40-60)	(90-110)	(40-60)	(40-60)	(80-100)	(40-60)	(30-50)
Mn	100	40	60	100	40	60	90	40	50
	(90-110)	(40-60)	(50-60)	(90-110)	(40-60)	(50-60)	(80-100)	(40-60)	(40-50)
Cu	15	7	8	15	7	8	15	7	8
	(7-15)	(5-10)	(8-10)	(7-15)	(5-10)	(8-10)	(7-15)	(5-10)	(8-10)
Fe	20	20	0	20	20	0	20	20	0
	(20-30)	(20-30)	(0-10)	(10-20)	(10-20)	(0-10)	(10-20)	(10-20)	(0-10)
Se	0.4	0.3	0.1	0.4	0.3	0.1	0.4	0.3	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)
I	1.5	0	1.5	1.5	0	1.5	1.5	0	1.5
	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)
Cr	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹ FPD = Foot Pads Dermatitis

² Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

³ If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

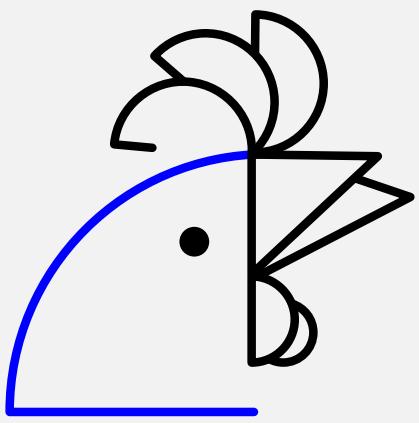
⁴ In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro® Availa® Se and the remainder by inorganic selenium.

⁴ Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

Zinpro General Recommendations

BROILERS

Antibiotic-Free Diet



BROILERS

Zinpro General Recommendations:
Performance, Carcass Quality and FPD

■ Antibiotic-Free Diet

Breast Myopathies/Meat Quality

Food Safety

Infectious Diseases Challenges

Sustainability

Genetic Breeder Lines

BREEDERS

LAYERS

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3}

Broilers	(0-10 days) Starter			(11-24 days) Grower			(25 days to end) Finisher		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	100	50	50	100	50	50	90	40	50
	(90-110)	(50-80)	(40-60)	(90-110)	(50-80)	(40-60)	(80-100)	(40-60)	(30-50)
Mn	100	50	50	100	50	50	90	40	50
	(90-110)	(40-60)	(50-60)	(90-110)	(40-60)	(50-60)	(80-100)	(40-60)	(40-50)
Cu	18	10	8	15	7	8	15	7	8
	(15-95)	(5-15)	(5-80)	(7-15)	(5-10)	(8-10)	(7-15)	(5-10)	(8-10)
Fe	20	20	0	20	20	0	20	20	0
	(20-30)	(20-30)	(0)	(10-20)	(10-20)	(0)	(10-20)	(10-20)	(0)
Se	0.4	0.3	0.1	0.4	0.3	0.1	0.4	0.3	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)
I	1.5	0	1.5	1.5	0	1.5	1.5	0	1.5
	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)
Cr	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

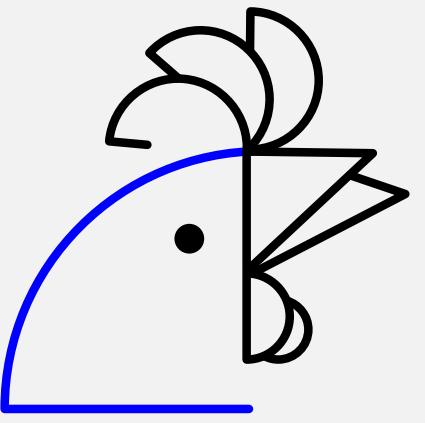
⁴Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

 Zinpro General Recommendations

 Levels and/or ranges that vary from the Broilers General Recommendations Table

BROILERS

Breast Myopathies/Meat Quality



BROILERS

Zinpro General Recommendations:
Performance, Carcass Quality and FPD

Antibiotic-Free Diet

■ Breast Myopathies/Meat Quality

Food Safety

Infectious Diseases Challenges

Sustainability

Genetic Breeder Lines

BREEDERS

LAYERS

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3,5}

Broilers	(0-10 days) Starter			(11-24 days) Grower			(25 days to end) Finisher		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	100	60	40	100	60	40	90	60	30
	(90-110)	(50-60)	(30-50)	(90-110)	(50-60)	(30-50)	(80-100)	(50-60)	(20-40)
Mn	100	40	60	100	40	60	90	40	50
	(90-110)	(40-60)	(50-60)	(90-110)	(40-60)	(50-60)	(80-100)	(40-60)	(40-50)
Cu	15	7	8	15	7	8	15	7	8
	(7-15)	(5-10)	(8-10)	(7-15)	(5-10)	(8-10)	(7-15)	(5-10)	(8-10)
Fe	20	20	0	20	20	0	20	20	0
	(20-30)	(20-30)	(0-10)	(10-20)	(10-20)	(0-10)	(10-20)	(10-20)	(0-10)
Se	0.4	0.3	0.1	0.4	0.3	0.1	0.4	0.3	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)
I	1.5	0	1.5	1.5	0	1.5	1.5	0	1.5
	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)
Cr	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0-0.4)	(0-0.4)	(0)	(0-0.4)	(0-0.4)	(0)	(0-0.4)	(0-0.4)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

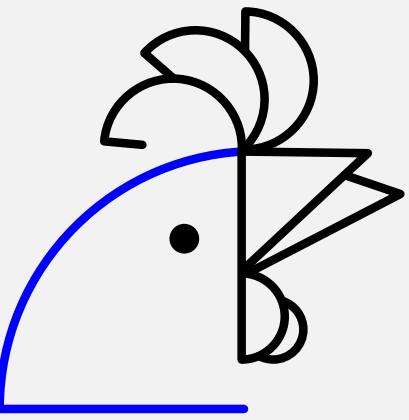
⁵When Zinpro® Availa® ZMC or Zinpro® Availa® ZnCr are not used in the diet, consider Zn-AA and Mn-AA at 60 ppm each.

 Zinpro General Recommendations

 Levels and/or ranges that vary from the Broilers General Recommendations Table

BROILERS

Food Safety



BROILERS

Zinpro General Recommendations:
Performance, Carcass Quality and FPD

Antibiotic-Free Diet

Breast Myopathies/Meat Quality

■ Food Safety

Infectious Diseases Challenges

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Genetic Breeder Lines

BREEDERS

LAYERS

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3}

Broilers	(0-10 days) Starter			(11-24 days) Grower			(25 days to end) Finisher		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	100	80	20	100	40	60	90	40	50
	(90-110)	(60-80)	(20-40)	(90-110)	(40-80)	(40-60)	(80-100)	(40-80)	(10-50)
Mn	100	40	60	100	40	60	90	40	50
	(90-110)	(40-60)	(50-60)	(90-110)	(40-60)	(50-60)	(80-100)	(40-60)	(40-50)
Cu	15	7	8	15	7	8	15	7	8
	(7-15)	(5-10)	(8-10)	(7-15)	(5-10)	(8-10)	(7-15)	(5-10)	(8-10)
Fe	20	20	0	20	20	0	20	20	0
	(20-30)	(20-30)	(0)	(0-20)	(0-20)	(0)	(0-20)	(0-20)	(0)
Se	0.4	0.3	0.1	0.4	0.3	0.1	0.4	0.3	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)
I	1.5	0	1.5	1.5	0	1.5	1.5	0	1.5
	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)
Cr	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹ Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

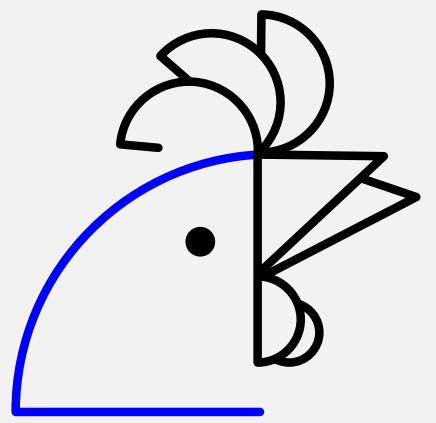
² If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³ In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴ Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

⁵ For a broiler market weight higher than 3.4 kg (7.5 lb), Zinpro Availa Zn 80 ppm from 21-30d is recommended to support gut integrity when exposed primary challenges like Coccidiosis and Necrotic Enteritis, which can open doors for secondary infections (e.g. *Salmonella*).

⁶ Starter - for *Salmonella* control, it is recommended supplementation of Zinpro Availa Zn 80 ppm during starter phase (0-10d) 80 ppm from 0-10d to support optimal development of gastrointestinal tract, intestinal microbiota and immune system. This Food Safety program should be used in conjunction with the Zinpro General Recommendations program of Broiler Breeders.



BROILERS

Infectious Diseases Challenges

BROILERS

Zinpro General Recommendations:
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TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3}

Broilers	(0-10 days) Starter			(11-24 days) Grower			(25 days to end) Finisher		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	100	60	40	100	60	40	90	60	30
	(90-110)	(60-80)	(40-50)	(90-110)	(60-80)	(40-50)	(80-100)	(60-80)	(30-40)
Mn	100	40	60	100	40	60	90	40	50
	(90-110)	(40-60)	(50-60)	(90-110)	(40-60)	(50-60)	(80-100)	(40-60)	(40-50)
Cu	15	7	8	15	7	8	15	7	8
	(7-15)	(5-10)	(8-10)	(7-15)	(5-10)	(8-10)	(7-15)	(5-10)	(8-10)
Fe	20	20	0	20	20	0	20	20	0
	(20-30)	(20-30)	(0-10)	(10-20)	(10-20)	(0-10)	(10-20)	(10-20)	(0-10)
Se	0.4	0.3	0.1	0.4	0.3	0.1	0.4	0.3	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)
I	1.5	0	1.5	1.5	0	1.5	1.5	0	1.5
	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)
Cr	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

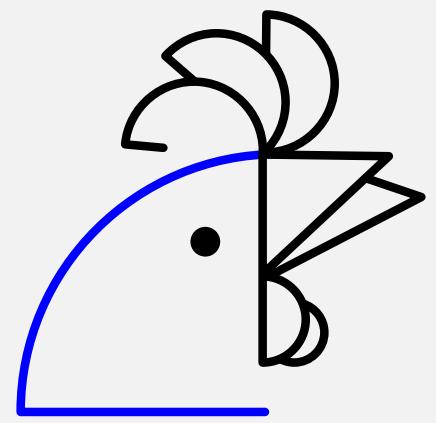
²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

 Zinpro General Recommendations

 Levels and/or ranges that vary from the Broilers General Recommendations Table



BROILERS

Zinpro General Recommendations:
Performance, Carcass Quality and FPD

Antibiotic-Free Diet

Breast Myopathies/Meat Quality

Food Safety

Infectious Diseases Challenges

Sustainability

Genetic Breeder Lines

BREEDERS

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TURKEYS

TURKEY BREEDERS



BROILERS

Sustainability

Trace Mineral, ppm^{1,2,3,5}

Broilers	(0-10 days) Starter			(11-24 days) Grower			(25 days to end) Finisher		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	60	60	0	60	60	0	60	60	0
	(50-80)	(50-80)	(0)	(50-80)	(50-80)	(0)	(50-80)	(50-80)	(0)
Mn	60	60	0	60	60	0	60	60	0
	(50-70)	(50-70)	(0)	(50-70)	(50-70)	(0)	(50-70)	(50-70)	(0)
Cu	10	10	0	10	10	0	10	10	0
	(7-11)	(7-11)	(0)	(7-11)	(7-11)	(0)	(7-11)	(7-11)	(0)
Fe	20	20	0	20	20	0	20	20	0
	(20-30)	(20-30)	(0)	(0-20)	(0-20)	(0)	(0-20)	(0-20)	(0)
Se	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0.3-0.4)	(0.3-0.4)	(0)	(0.3-0.4)	(0.3-0.4)	(0)	(0.3-0.4)	(0.3-0.4)	(0)
I	1.5	0	1.5	1.5	0	1.5	1.5	0	1.5
	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)	(1.5-4)	(0)	(1.5-4)
Cr	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

⁵To be used along with super-dose of phytase in the diets.

Zinpro General Recommendations

Levels and/or ranges that vary from the Broilers General Recommendations Table

BROILERS

Genetic Breeder Lines

BROILERS

Zinpro General Recommendations:
Performance, Carcass Quality and FPD

Antibiotic-Free Diet

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■ Genetic Breeder Lines

BREEDERS

LAYERS

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm

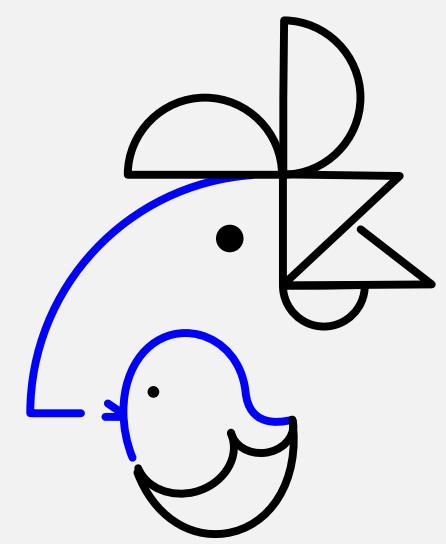
Broilers	Starter		Grower		Finisher	
	Aviagen ¹	Cobb ²	Aviagen	Cobb	Aviagen	Cobb
Zn	120	100	120	100	120	100
Mn	120	100	120	100	120	100
Cu	16	15	16	15	16	15
Fe	20	40	20	40	20	40
Se	0.30	0.35	0.30	0.35	0.30	0.35
I	1.25	1.00	1.25	1.00	1.25	1.00
Cr	—	—	—	—	—	—

¹ Aviagen, 2022.

² Cobb-Vantress, version L-054-01-22.

BREEDERS

- Zinpro General Recommendations
- Infectious Diseases Challenges
- Sustainability
- Genetic Breeder Lines



BROILERS

BREEDERS

Zinpro General Recommendations

Infectious Diseases Challenges

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TURKEY BREEDERS



BREEDERS

Zinpro General Recommendations

Trace Mineral, ppm^{1,2,3,4}

Breeders	Pullets			Hens		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic
Zn	100	40	60	110	40	70
	(90-110)	(40-60)	(40-60)	(90-110)	(40-60)	(50-70)
Mn	110	40	70	120	40	80
	(100-110)	(40-60)	(60-70)	(100-120)	(40-60)	(60-80)
Cu	13	7	6	15	7	8
	(7-15)	(5-7)	(5-10)	(7-15)	(5-7)	(5-10)
Fe	35	35	0	40	40	0
	(20-40)	(20-40)	(0-10)	(30-50)	(30-50)	(0-10)
Se	0.35	0.20	0.15	0.40	0.20	0.20
	(0.2-0.4)	(0.2-0.4)	(0-0.2)	(0.3-0.5)	(0.2-0.4)	(0.1-0.3)
I	2.5	0	2.5	3.0	0	3.0
	(2-4)	(0)	(2-4)	(2-4)	(0)	(2-4)
Cr	—	—	—	—	—	—
	—	—	—	—	—	—

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

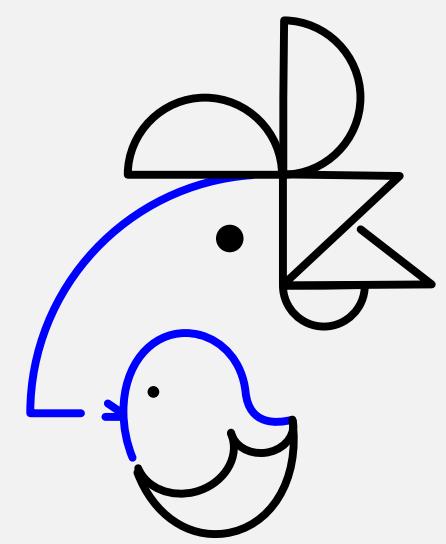
²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴Consider using the Layer Premix in the Pre-Layer diet.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

Zinpro General Recommendations



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BREEDERS

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TURKEY BREEDERS



BREEDERS

Infectious Diseases Challenges

Trace Mineral, ppm^{1,2,3,4}

Breeders	Pullets			Hens		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic
Zn	100	60	40	110	60	50
	(90-110)	(60-80)	(30-50)	(90-110)	(60-80)	(30-50)
Mn	110	40	70	120	40	80
	(100-110)	(40-60)	(60-70)	(100-120)	(40-60)	(60-80)
Cu	13	7	6	15	7	8
	(7-15)	(5-7)	(5-10)	(7-15)	(5-7)	(5-10)
Fe	35	35	0	40	40	0
	(20-40)	(20-40)	(0-10)	(30-50)	(30-50)	(0-10)
Se	0.35	0.20	0.15	0.40	0.20	0.20
	(0.2-0.4)	(0.2-0.4)	(0-0.2)	(0.3-0.5)	(0.2-0.4)	(0.1-0.3)
I	2.5	0	2.5	3.0	0	3.0
	(2-4)	(0)	(2-4)	(2-4)	(0)	(2-4)
Cr	—	—	—	—	—	—
	—	—	—	—	—	—

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

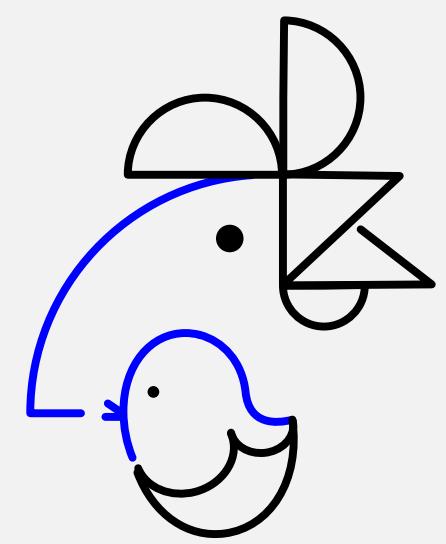
³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴Consider using the Layer Premix in the Pre-Layer diet.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

■ Zinpro General Recommendations

■ Levels and/or ranges that vary from the Breeders General Recommendations Table



BROILERS

BREEDERS

Zinpro General Recommendations

Infectious Diseases Challenges

Sustainability

Genetic Breeder Lines

LAYERS

TURKEYS

TURKEY BREEDERS



BREEDERS

Sustainability

Trace Mineral, ppm^{1,2,3,4,6}

Breeders	Pullets			Hens		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic
Zn	60	60	0	60	60	0
	(40-70)	(40-70)	(0)	(40-70)	(40-70)	(0)
Mn	60	60	0	60	60	0
	(40-70)	(40-70)	(0)	(40-70)	(40-70)	(0)
Cu	10.5	10.5	0	10.5	10.5	0
	(8-12)	(8-12)	(0)	(8-12)	(8-12)	(0)
Fe	35	35	0	40	40	0
	(20-40)	(20-40)	(0)	(30-50)	(30-50)	(0)
Se	0.3	0.3	0	0.3	0.3	0
	(0.2-0.4)	(0.2-0.4)	(0)	(0.3-0.5)	(0.2-0.4)	(0)
I	2.5	0	2.5	3.0	0	3.0
	(2-4)	(0)	(2-4)	(2-4)	(0)	(2-4)
Cr	—	—	—	—	—	—
	—	—	—	—	—	—

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

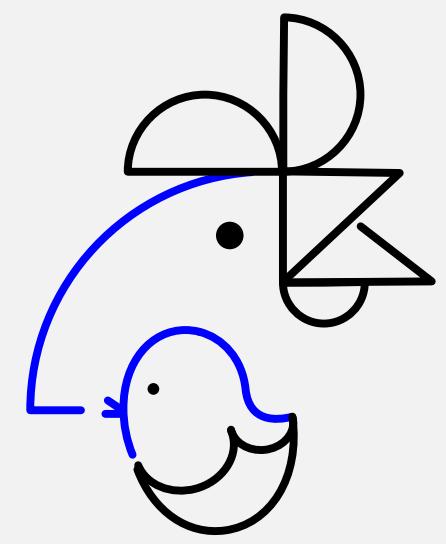
⁴Consider using the Layer Premix in the Pre-Layer diet.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

⁶To be used along with super-dose of phytase in the diets.

■ Zinpro General Recommendations

■ Levels and/or ranges that vary from the Breeders General Recommendations Table



BROILERS

BREEDERS

Zinpro General Recommendations

Infectious Disease Challenges

Sustainability

■ Genetic Breeder Lines

LAYERS

TURKEYS

TURKEY BREEDERS



BREEDERS

Genetic Breeder Lines

Trace Mineral, ppm

Breeders	Pullets			Hens		
	Aviagen ¹	Cobb ²	Hubbard ³	Aviagen	Cobb	Hubbard
Zn	120	100	100	120	110	100
Mn	120	100	100	120	120	100
Cu	16	10-15	10	10	10-15	10
Fe	40	20-50	50	50	40-55	50
Se	0.3	0.3	0.3-0.4	0.3	0.3	0.3-0.4
I	2.0	1.5	2.0	3.0	2.0	2.0
Cr	—	—	—	—	—	—

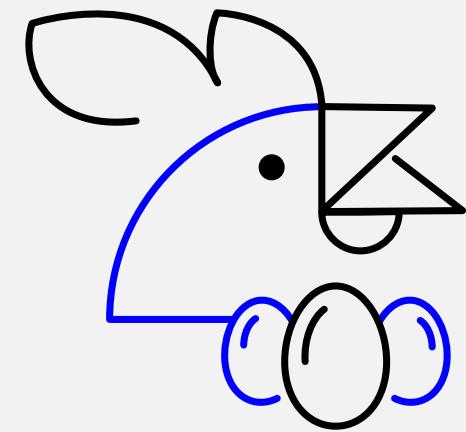
¹ Aviagen, 2021.

² Cobb-Vantress, versions L-004-01-20 and L-011-01-20.

³ Hubbard, 2011.

LAYERS

- **Zinpro General Recommendations**
- **Food Safety**
- **Infectious Diseases Challenges**
- **Heat and Cold Stresses**
- **Sustainability**
- **Darker Eggshell Color**
- **Longevity**
- **Genetic Breeder Lines**



LAYERS

Zinpro General Recommendations

BROILERS

BREEDERS

LAYERS

Zinpro General Recommendations

- Food Safety
- Infectious Diseases Challenges
- Heat and Cold Stresses
- Sustainability
- Darker Eggshell Color
- Longevity
- Genetic Breeder Lines

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3,4}

Comm. Layers	Pullets			Layers		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic
Zn	65	28	37	70	30	40
	(50-70)	(25-50)	(30-40)	(60-70)	(30-40)	(30-40)
Mn	65	28	37	70	30	40
	(50-70)	(25-50)	(30-40)	(60-70)	(30-40)	(30-40)
Cu	7.5	4.9	2.6	8.0	5.3	2.7
	(7-11)	(4-8)	(2-4)	(7-12)	(4-8)	(2-5)
Fe	27	27	0	30	30	0
	(20-30)	(20-30)	(0-10)	(20-30)	(20-30)	(0-10)
Se	0.18	0.09	0.09	0.20	0.10	0.10
	(0.15-0.25)	(0.05-0.12)	(0.05-0.12)	(0.2-0.25)	(0.1-0.15)	(0.1-0.15)
I	1.4	0	1.4	1.5	0	1.5
	(1.4-3)	(0)	(1.4-3)	(1.4-3)	(0)	(1.4-3)
Cr	0.23	0.23	0	0.25	0.25	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

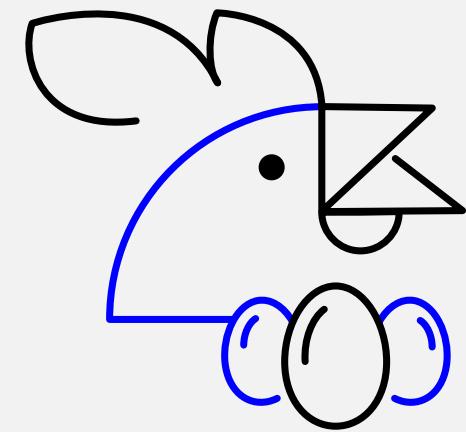
²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴When formulating to light weight layers, reduce the premix recommendation by 10%.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

Zinpro General Recommendations



BROILERS

BREEDERS

LAYERS

Zinpro General Recommendations

Food Safety

Infectious Diseases Challenges

Heat and Cold Stresses

Sustainability

Darker Eggshell Color

Longevity

Genetic Breeder Lines

TURKEYS

TURKEY BREEDERS

LAYERS Food Safety

Trace Mineral, ppm^{1,2,3,4}

Comm. Layers	Pullets			Layers		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic
Zn	80	80	0	70	30	40
	(60-90)	(60-90)	(0-20)	(60-70)	(30-60)	(30-40)
Mn	65	40	25	70	30	40
	(50-70)	(25-50)	(25-40)	(60-70)	(30-60)	(30-40)
Cu	15.0	7.0	8.0	8.0	5.3	2.7
	(7-15)	(5-10)	(5-10)	(7-12)	(4-8)	(2-5)
Fe	27	27	0	30	30	0
	(20-30)	(20-30)	(0)	(20-30)	(20-30)	(0)
Se	0.18	0.09	0.09	0.20	0.10	0.10
	(0.15-0.25)	(0.05-0.12)	(0.05-0.12)	(0.2-0.25)	(0.1-0.15)	(0.1-0.15)
I	1.4	0	1.4	1.5	0	1.5
	(1.4-3)	(0)	(1.4-3)	(1.4-3)	(0)	(1.4-3)
Cr	0.23	0.23	0	0.25	0.25	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

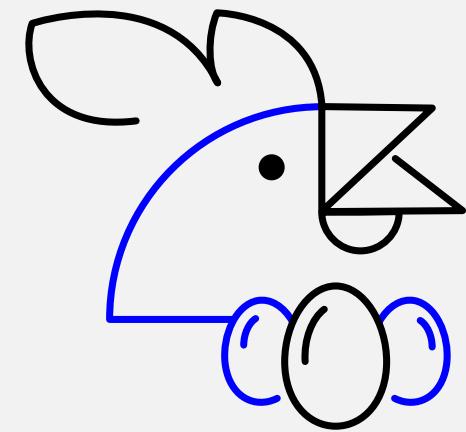
³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴When formulating to light weight layers, reduce the premix recommendation by 10%.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

Zinpro General Recommendations

Levels and/or ranges that vary from the Layers General Recommendations Table



LAYERS

Infectious Diseases Challenges

BROILERS

BREEDERS

LAYERS

Zinpro General Recommendations

Food Safety

Infectious Diseases Challenges

Heat and Cold Stresses

Sustainability

Darker Eggshell Color

Longevity

Genetic Breeder Lines

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3,4}

Comm. Layers	Pullets			Layers		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic
Zn	70 (70-90)	50 (50-70)	20 (20-30)	70 (60-70)	50 (40-60)	20 (10-20)
Mn	65 (50-70)	28 (25-50)	35 (30-40)	70 (60-70)	30 (30-40)	40 (30-40)
Cu	7.5 (7-11)	4.9 (4-8)	2.6 (2-4)	8.0 (7-12)	5.3 (4-8)	2.7 (2-5)
Fe	27 (20-30)	27 (20-30)	0 (0-10)	30 (20-30)	30 (20-30)	0 (0-10)
Se	0.18 (0.15-0.25)	0.09 (0.05-0.12)	0.09 (0.05-0.12)	0.20 (0.2-0.25)	0.10 (0.1-0.15)	0.10 (0.1-0.15)
I	1.4 (1.4-3)	0 (0)	1.4 (1.4-3)	1.5 (1.4-3)	0 (0)	1.5 (1.4-3)
Cr	0.23 (0-0.3)	0.23 (0-0.3)	0 (0)	0.25 (0-0.3)	0.25 (0-0.3)	0 (0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

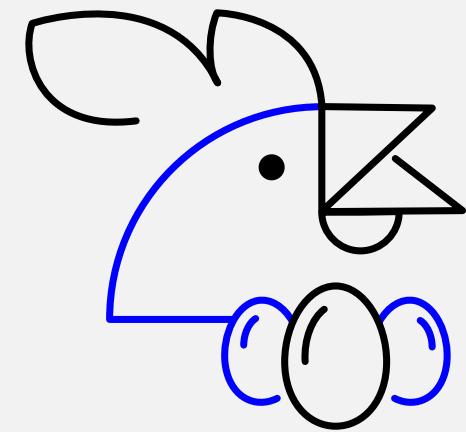
³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴When formulating to light weight layers, reduce the premix recommendation by 10%.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

Zinpro General Recommendations

Levels and/or ranges that vary from the Layers General Recommendations Table



LAYERS

Heat and Cold Stresses

BROILERS

BREEDERS

LAYERS

Zinpro General Recommendations

Food Safety

Infectious Diseases Challenges

■ Heat and Cold Stresses

Sustainability

Darker Eggshell Color

Longevity

Genetic Breeder Lines

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3,4}

Comm. Layers	Pullets			Layers		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic
Zn	65	40	25	70	40	30
	(50-70)	(30-60)	(20-40)	(60-70)	(30-60)	(20-40)
Mn	65	40	25	70	40	30
	(50-70)	(30-50)	(20-40)	(60-70)	(30-50)	(20-40)
Cu	7.5	7.0	0.5	8.0	7.0	1.0
	(7-11)	(5-8)	(0-2)	(7-12)	(5-8)	(0-3)
Fe	27	27	0	30	30	0
	(20-30)	(20-30)	(0-10)	(20-30)	(20-30)	(0-10)
Se	0.18	0.09	0.09	0.25	0.15	0.10
	(0.15-0.25)	(0.05-0.12)	(0.05-0.12)	(0.2-0.3)	(0.15-0.2)	(0.1-0.15)
I	1.4	0	1.4	1.5	0	1.5
	(1.4-3)	(0)	(1.4-3)	(1.4-3)	(0)	(1.4-3)
Cr	0.23	0.23	0	0.25	0.25	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

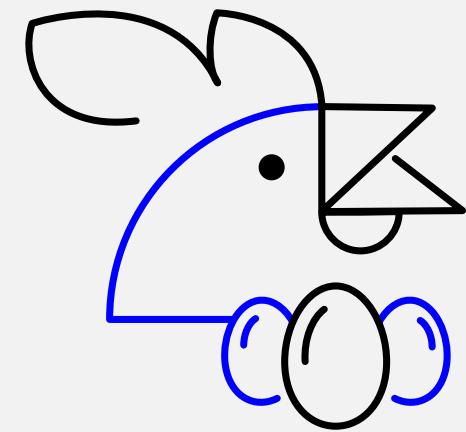
³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴When formulating to light weight layers, reduce the premix recommendation by 10%.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

■ Zinpro General Recommendations

■ Levels and/or ranges that vary from the Layers General Recommendations Table



BROILERS

BREEDERS

LAYERS

Zinpro General Recommendations

Food Safety

Infectious Diseases Challenges

Heat and Cold Stresses

Sustainability

Darker Eggshell Color

Longevity

Genetic Breeder Lines

TURKEYS

TURKEY BREEDERS



LAYERS

Sustainability

Trace Mineral, ppm^{1,2,3,4,6}

Comm. Layers	Pullets			Layers		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic
Zn	30	30	0	40	40	0
	(30-60)	(30-60)	(0)	(30-60)	(30-60)	(0)
Mn	30	30	0	40	40	0
	(30-60)	(30-60)	(0)	(30-60)	(30-60)	(0)
Cu	5.3	5.3	0	7.0	7.0	0
	(5-10)	(5-10)	(0)	(5-10)	(5-10)	(0)
Fe	10	10	0	15	15	0
	(10-20)	(10-20)	(0)	(15-20)	(15-20)	(0)
Se	0.15	0.15	0	0.18	0.18	0
	(0.15-0.25)	(0.15-0.25)	(0)	(0.15-0.25)	(0.15-0.25)	(0)
I	1.4	0	1.4	1.5	0	1.5
	(1.4-3)	(0)	(1.4-3)	(1.4-3)	(0)	(1.4-3)
Cr	0.23	0.23	0	0.25	0.25	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

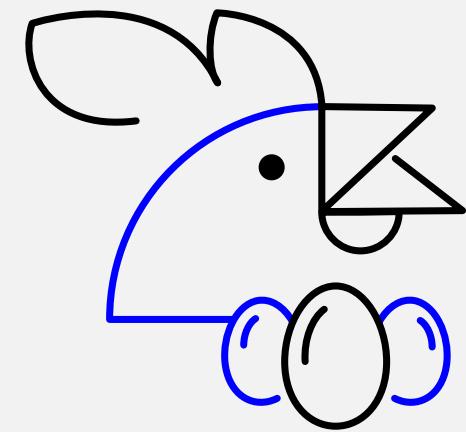
⁴When formulating to light weight Layers, reduce the premix recommendation by 10%.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

⁶To be used along with regular dose or super-dose of phytase in the diets.

Zinpro General Recommendations

Levels and/or ranges that vary from the Layers General Recommendations Table



LAYERS

Darker Eggshell Color

BROILERS

BREEDERS

LAYERS

Zinpro General Recommendations

Food Safety

Infectious Diseases Challenges

Heat and Cold Stresses

Sustainability

Darker Eggshell Color

Longevity

Genetic Breeder Lines

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3,4}

Comm. Layers	Pullets			Layers		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic
Zn	65	30	35	70	40	30
	(50-70)	(25-50)	(30-40)	(60-70)	(40-50)	(30-40)
Mn	65	30	35	70	40	30
	(50-70)	(25-50)	(30-40)	(60-70)	(40-50)	(30-40)
Cu	7.5	4.9	2.6	8.0	7.0	1.0
	(7-11)	(4-8)	(2-4)	(7-12)	(4-8)	(0-3)
Fe	27	27	0	40	40	0
	(20-30)	(20-30)	(0-10)	(30-40)	(30-40)	(0-10)
Se	0.18	0.09	0.09	0.20	0.10	0.10
	(0.15-0.25)	(0.05-0.12)	(0.05-0.12)	(0.2-0.25)	(0.1-0.15)	(0.1-0.15)
I	1.4	0	1.4	1.5	0	1.5
	(1.4-3)	(0)	(1.4-3)	(1.4-3)	(0)	(1.4-3)
Cr	0.23	0.23	0	0.25	0.25	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

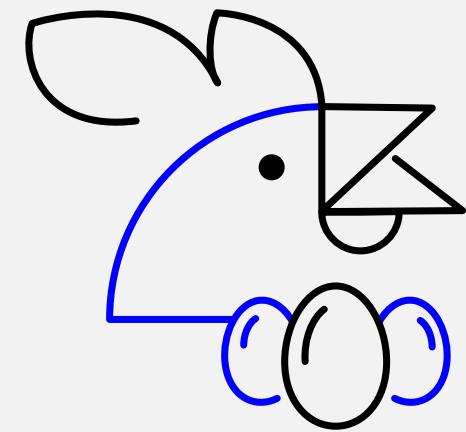
³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴When formulating to light weight layers, reduce the premix recommendation by 10%.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

Zinpro General Recommendations

Levels and/or ranges that vary from the Layers General Recommendations Table



LAYERS

Longevity

BROILERS

BREEDERS

LAYERS

Zinpro General Recommendations

Food Safety

Infectious Diseases Challenges

Heat and Cold Stresses

Sustainability

Darker Eggshell Color

■ Longevity

Genetic Breeder Lines

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3,4}

Comm. Layers	Pullets			Layers to 50 weeks			Layers - 51 to 100 weeks		
	Total	Zinpro	Inorganic ⁵	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	65	28	37	70	30	40	70	40	30
	(50-70)	(25-50)	(30-40)	(60-70)	(30-40)	(30-40)	(60-70)	(40-50)	(20-30)
Mn	65	28	37	70	30	40	70	40	30
	(50-70)	(25-50)	(30-40)	(60-70)	(30-40)	(30-40)	(60-70)	(40-50)	(20-30)
Cu	7.5	4.9	2.6	8.0	5.3	2.7	8.0	7.0	1.0
	(7-11)	(4-8)	(2-4)	(7-12)	(4-8)	(2-5)	(7-12)	(5-8)	(0-3)
Fe	27	27	0	30	30	0	30*	30*	0
	(20-30)	(20-30)	(0-10)	(20-30)	(20-30)	(0-10)	(30-40)	(30-40)	(0-10)
Se	0.18	0.09	0.09	0.20	0.10	0.10	0.30	0.20	0.10
	(0.15-0.25)	(0.05-0.12)	(0.05-0.12)	(0.2-0.25)	(0.1-0.15)	(0.1-0.15)	(0.25-0.3)	(0.15-0.2)	(0.1-0.15)
I	1.4	0	1.4	1.5	0	1.5	1.5	0	1.5
	(1.4-3)	(0)	(1.4-3)	(1.4-3)	(0)	(1.4-3)	(1.4-3)	(0)	(1.4-3)
Cr	0.23	0.23	0	0.25	0.25	0	0.25	0.25	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

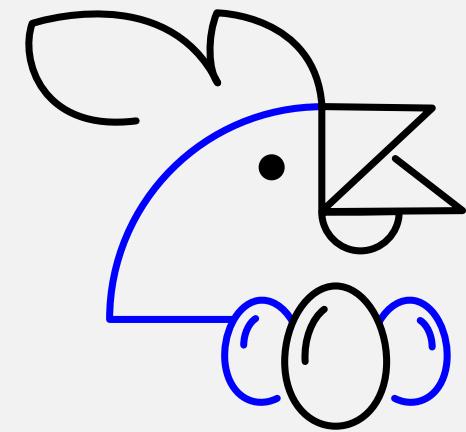
⁴When formulating to light weight layers, reduce the premix recommendation by 10%.

⁵Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

* For Brown Eggshell Layers, Zinpro® Availa® Fe/Zinpro® ProPath® Fe should be increased to 40 ppm to reach Total of 40 ppm Fe for darker eggshell color.

Zinpro General Recommendations

Levels and/or ranges that vary from the Layers General Recommendations Table



LAYERS

Genetic Breeder Lines

BROILERS

BREEDERS

LAYERS

Zinpro General Recommendations

Food Safety

Infectious Diseases Challenges

Heat and Cold Stresses

Sustainability

Darker Eggshell Color

Longevity

■ Genetic Breeder Lines

TURKEYS

TURKEY BREEDERS



Trace Mineral, ppm

Comm. Layers	Pullets			Layers		
	Hy-Line ¹	Lohmann ²	ISA/Bovan/ Dekalb ³	Hy-Line	Lohmann	ISA/Bovan/ Dekalb
Zn	85	60	80	80	60	80
Mn	90	100	85	90	100	85
Cu	15	5	10	8	5	10
Fe	30	25	80	40	25	80
Se	0.25	0.20	0.30	0.22	0.20	0.30
I	1.5	0.5	1.0	1.2	0.5	1.0
Cr	—	—	—	—	—	—

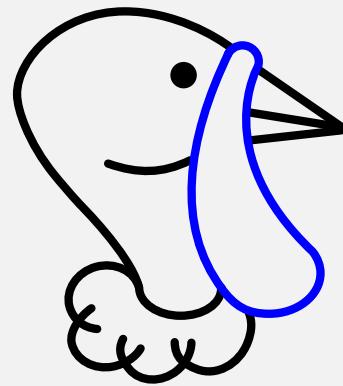
¹Hy-Line W-36, 2020; HyLine Brown, 2018.

²Lohmann Brown and LSL lines, 08/21_V01-22.

³ISA/Bovan/Dekalb - Hendrix Genetics brown and white lines, versions L8110-2-NA, L8110-2, L2221-1, respectively.

TURKEYS

- Zinpro General Recommendations:
Performance and Carcass Quality
- Antibiotic-Free Diet
- Food Safety
- Infectious Diseases Challenges
- Sustainability
- Genetic Breeder Lines



TURKEYS

Zinpro General Recommendations: Performance and Carcass Quality

BROILERS

BREEDERS

LAYERS

TURKEYS

Zinpro General Recommendations: Performance and Carcass Quality

Antibiotic-Free Diet

Food Safety

Infectious Diseases Challenges

Sustainability

Genetic Breeder Lines

TURKEY BREEDERS



BROILERS

BREEDERS

LAYERS

TURKEYS

Trace Mineral, ppm^{1,2,3}

Turkeys	(0-3 wks) Starter			(4-6 wks) Grower			(7-12 wks) Finisher			(13-21 wks) Withdrawal		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	110	50	60	110	50	60	100	40	60	90	40	50
	(90-120)	(50-60)	(50-60)	(90-120)	(50-60)	(50-60)	(90-100)	(40-60)	(40-60)	(80-90)	(40-60)	(30-50)
Mn	110	50	60	110	50	60	100	40	60	90	40	50
	(90-120)	(50-60)	(50-60)	(90-120)	(50-60)	(50-60)	(90-100)	(40-60)	(40-60)	(80-90)	(40-60)	(40-50)
Cu	15	9	6	15	9	6	15	7	8	15	7	8
	(15-20)	(9-12)	(6-8)	(15-20)	(9-12)	(6-8)	(7-15)	(5-7)	(8-10)	(7-15)	(5-7)	(8-10)
Fe	30	20	10	30	20	10	20	20	0	10	10	0
	(30-40)	(20-30)	(0-10)	(30-40)	(20-30)	(0-10)	(15-25)	(15-25)	(0-10)	(10-15)	(10-15)	(0-10)
Se	0.4	0.3	0.1	0.4	0.3	0.1	0.3	0.2	0.1	0.3	0.2	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.2)	(0.3-0.4)	(0.2-0.3)	(0.1-0.2)	(0.3-0.4)	(0.15-0.25)	(0.1-0.2)	(0.3-0.4)	(0.15-0.25)	(0.1-0.2)
I	2	0	2	2	0	2	2	0	2	2	0	2
	(2-3)	(0)	(2-3)	(2-3)	(0)	(2-3)	(2-3)	(0)	(2-3)	(2-3)	(0)	(2-3)
Cr	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

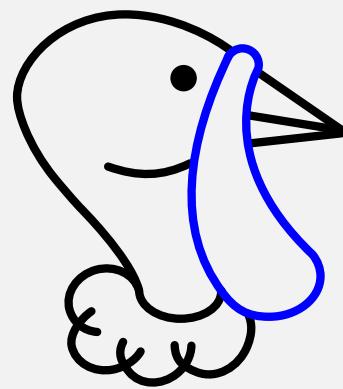
¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

 Zinpro General Recommendations



TURKEYS

Antibiotic-Free Diet

BROILERS
BREEDERS
LAYERS
TURKEYS
Zinpro General Recommendations: Performance and Carcass Quality
■ Antibiotic-Free Diet
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Infectious Diseases Challenges
Sustainability
Genetic Breeder Lines
TURKEY BREEDERS


Trace Mineral, ppm^{1,2,3}

Turkeys	(0-3 wks) Starter			(4-6 wks) Grower			(7-12 wks) Finisher			(13-21 wks) Withdrawal		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	120 (90-120)	60 (50-60)	60 (50-60)	120 (90-120)	60 (50-60)	60 (50-60)	100 (90-100)	40 (40-60)	60 (40-60)	90 (80-90)	40 (40-60)	50 (30-50)
Mn	120 (90-120)	60 (50-60)	60 (50-60)	120 (90-120)	60 (50-60)	60 (50-60)	100 (90-100)	40 (40-60)	60 (40-60)	90 (80-90)	40 (40-60)	50 (40-50)
Cu	30 (15-110)	21 (15-25)	9 (8-80)	30 (15-110)	21 (15-25)	9 (8-80)	30 (15-110)	21 (15-25)	9 (8-80)	15 (7-15)	7 (5-7)	8 (8-10)
Fe	20 (15-30)	20 (15-30)	0 (0)	20 (15-30)	20 (15-30)	0 (0)	20 (15-25)	20 (15-25)	0 (0)	10 (10-15)	10 (10-15)	0 (0)
Se	0.4 (0.3-0.4)	0.3 (0.2-0.3)	0.1 (0.1-0.2)	0.4 (0.3-0.4)	0.3 (0.2-0.3)	0.1 (0.1-0.2)	0.3 (0.3-0.4)	0.2 (0.15-0.25)	0.1 (0.1-0.2)	0.3 (0.3-0.4)	0.2 (0.15-0.25)	0.1 (0.1-0.2)
I	2 (2-3)	0 (0)	2 (2-3)	2 (2-3)	0 (0)	2 (2-3)	2 (2-3)	0 (0)	2 (2-3)	2 (2-3)	0 (0)	2 (2-3)
Cr	0.3 (0-0.3)	0.3 (0-0.3)	0 (0)	0.3 (0-0.3)	0.3 (0-0.3)	0 (0)	0.3 (0-0.3)	0.3 (0-0.3)	0 (0)	0.3 (0-0.3)	0.3 (0-0.3)	0 (0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

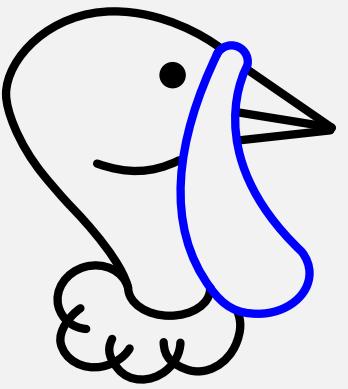
⁴Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

 Zinpro General Recommendations

 Levels and/or ranges that vary from the Turkeys General Recommendations Table

TURKEYS

Food Safety



BROILERS

BREEDERS

LAYERS

TURKEYS

Zinpro General Recommendations:
Performance and Carcass Quality

Antibiotic-Free Diet

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Genetic Breeder Lines

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3}

Turkeys	(0-3 wks) Starter*			(4-6 wks) Grower ^{*6}			(7-12 wks) Finisher ^{5,6}			(13-21 wks) Withdrawal ⁶		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	110 (90-120)	80 (60-80)	30 (20-40)	110 (90-120)	80 (60-80)	30 (20-40)	100 (90-100)	40 (40-80)	60 (40-60)	90 (80-90)	40 (40-80)	50 (20-50)
Mn	110 (90-120)	50 (50-60)	60 (50-60)	110 (90-120)	50 (50-60)	60 (50-60)	100 (90-100)	40 (40-60)	60 (40-60)	90 (80-90)	40 (40-60)	50 (40-50)
Cu	15 (15-20)	9 (9-12)	6 (6-8)	15 (15-20)	9 (9-12)	6 (6-8)	15 (7-15)	7 (5-7)	8 (8-10)	15 (7-15)	7 (5-7)	8 (8-10)
Fe	20 (15-25)	20 (15-25)	0 (0)	20 (15-25)	20 (15-25)	0 (0)	20 (15-25)	20 (15-25)	0 (0)	10 (10-15)	10 (10-15)	0 (0)
Se	0.4 (0.3-0.4)	0.3 (0.2-0.3)	0.1 (0.1-0.2)	0.4 (0.3-0.4)	0.3 (0.2-0.3)	0.1 (0.1-0.2)	0.3 (0.3-0.4)	0.2 (0.15-0.25)	0.1 (0.1-0.2)	0.3 (0.3-0.4)	0.2 (0.15-0.25)	0.1 (0.1-0.2)
I	2 (2-3)	0 (0)	2 (2-3)	2 (2-3)	0 (0)	2 (2-3)	2 (2-3)	0 (0)	2 (2-3)	2 (2-3)	0 (0)	2 (2-3)
Cr	0.3 (0-0.3)	0.3 (0-0.3)	0 (0)	0.3 (0-0.3)	0.3 (0-0.3)	0 (0)	0.3 (0-0.3)	0.3 (0-0.3)	0 (0)	0.3 (0-0.3)	0.3 (0-0.3)	0 (0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

⁵If this diet will be the last one for females prior to processing, utilize recommendations of withdrawal feed.

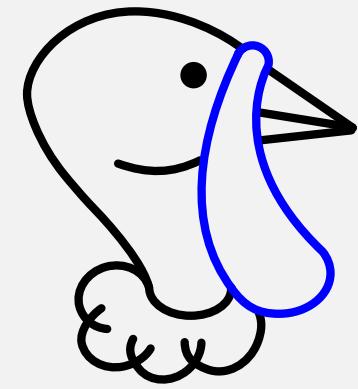
^{*}Starter/Grower - for *Salmonella* control, it is recommended supplementation of Zinpro Availa Zn 80 ppm from 0-6 wks (brooding phase) to support optimal development of gastrointestinal tract, intestinal microbiota and immune system. This Food Safety program should be used in conjunction with the Zinpro General Recommendations program for Turkey Breeders.

⁶When raising toms, Zinpro Availa Zn 80 ppm from 10-14 wks is recommended to support gut integrity when exposed to primary challenges like Coccidiosis and Necrotic Enteritis, which can result in secondary infections (e.g. *Salmonella*).

PREVIOUS NEXT

TURKEYS

Infectious Diseases Challenges



BROILERS

BREEDERS

LAYERS

TURKEYS

Zinpro General Recommendations:
Performance and Carcass Quality

Antibiotic-Free Diet

Food Safety

■ Infectious Diseases Challenges

Sustainability

Genetic Breeder Lines

TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3}

Turkeys	(0-3 wks) Starter			(4-6 wks) Grower			(7-12 wks) Finisher			(13-21 wks) Withdrawal		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	110	60	50	110	60	50	100	40	60	90	40	50
	(90-120)	(60-80)	(40-50)	(90-120)	(60-80)	(40-50)	(90-100)	(40-60)	(40-60)	(80-90)	(40-60)	(30-50)
Mn	110	40	70	110	40	70	100	40	60	90	40	50
	(100-120)	(40-50)	(60-70)	(100-120)	(40-50)	(60-70)	(90-100)	(40-60)	(40-60)	(80-90)	(40-60)	(40-50)
Cu	15	7	8	15	7	8	15	7	8	15	7	8
	(10-20)	(5-10)	(8-10)	(10-20)	(5-10)	(8-10)	(7-15)	(5-7)	(8-10)	(7-15)	(5-7)	(8-10)
Fe	30	20	10	30	20	10	20	20	0	10	10	0
	(30-40)	(20-30)	(0-10)	(30-40)	(20-30)	(0-10)	(15-25)	(15-25)	(0-10)	(10-15)	(10-15)	(0-10)
Se	0.4	0.3	0.1	0.4	0.3	0.1	0.3	0.2	0.1	0.3	0.2	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.2)	(0.3-0.4)	(0.2-0.3)	(0.1-0.2)	(0.3-0.4)	(0.15-0.25)	(0.1-0.2)	(0.3-0.4)	(0.15-0.25)	(0.1-0.2)
I	2	0	2	2	0	2	2	0	2	2	0	2
	(2-3)	(0)	(2-3)	(2-3)	(0)	(2-3)	(2-3)	(0)	(2-3)	(2-3)	(0)	(2-3)
Cr	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

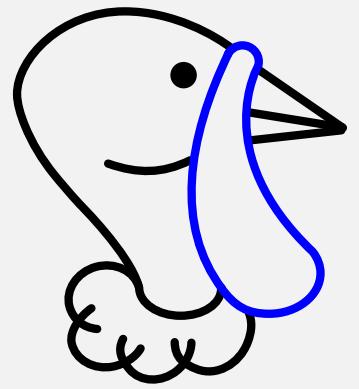
⁴Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

 Zinpro General Recommendations

 Levels and/or ranges that vary from the Turkeys General Recommendations Table

TURKEYS

Sustainability



BROILERS
BREEDERS
LAYERS
TURKEYS

Zinpro General Recommendations:
Performance and Carcass Quality

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TURKEY BREEDERS



Trace Mineral, ppm^{1,2,3,5}

Turkeys	(0-3 wks) Starter			(4-6 wks) Grower			(7-12 wks) Finisher			(13-21 wks) Withdrawal		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic	Total	Zinpro	Inorganic
Zn	90	60	30	90	60	30	80	50	30	70	40	30
	(80-100)	(50-70)	(40-60)	(80-100)	(50-70)	(40-60)	(70-90)	(50-70)	(20-40)	(70-90)	(40-60)	(20-40)
Mn	100	60	40	100	60	40	80	50	30	70	40	30
	(90-110)	(50-70)	(30-50)	(90-110)	(50-70)	(30-50)	(70-90)	(50-70)	(20-40)	(70-90)	(40-60)	(20-40)
Cu	15.0	10.5	4.5	15.0	10.5	4.5	9.0	9.0	0	7.0	7.0	0
	(15-20)	(9-12)	(4-8)	(15-20)	(9-12)	(4-8)	(7-12)	(8-12)	(0-4)	(7-10)	(5-7)	(0-3)
Fe	30	20	10	30	20	10	20	20	0	10	10	0
	(30-40)	(20-30)	(0-10)	(30-40)	(20-30)	(0-10)	(15-25)	(15-25)	(0-10)	(10-15)	(10-15)	(0-10)
Se	0.4	0.3	0.1	0.4	0.3	0.1	0.3	0.2	0.1	0.3	0.2	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.2)	(0.3-0.4)	(0.2-0.3)	(0.1-0.2)	(0.3-0.4)	(0.15-0.25)	(0.1-0.2)	(0.3-0.4)	(0.15-0.25)	(0.1-0.2)
I	2	0	2	2	0	2	2	0	2	2	0	2
	(2-3)	(0)	(2-3)	(2-3)	(0)	(2-3)	(2-3)	(0)	(2-3)	(2-3)	(0)	(2-3)
Cr	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

²If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

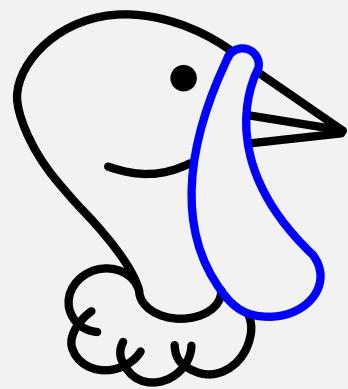
³In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

⁵To be used along with a regular dose or super-dose of phytase in the diets.

 Zinpro General Recommendations

 Levels and/or ranges that vary from the Turkeys General Recommendations Table



TURKEYS

Genetic Breeder Lines

BROILERS

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Zinpro General Recommendations:
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■ Genetic Breeder Lines

TURKEY BREEDERS



Trace Mineral, ppm

Turkeys	Starter		Grower		Finisher		Withdrawal	
	Aviagen ¹	Hybrid ²	Aviagen	Hybrid	Aviagen	Hybrid	Aviagen	Hybrid
Zn	140-160	100	140	100	120	90	120	90
Mn	140-160	100	140	100	120	90	120	90
Cu	20	15	10	15	10	12	10	12
Fe	80-100	60	60	60	45	55	45	55
Se	0.30	0.30	0.30	0.30	0.25	0.30	0.20	0.30
I	2.0-3.0	1.5	2.0	1.5	1.0	1.3	1.0	1.3
Cr	—	—	—	—	—	—	—	—

¹Aviagen, 2019.

²Hybrid-Hendrix Genetics, VTS_CS_E_L_09_16.

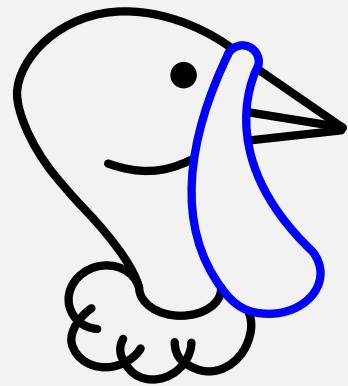
A close-up photograph of several white turkeys in a farm setting. The turkeys have characteristic red and pink skin around their eyes and wattles. The background is slightly blurred, showing more of the flock.

TURKEY BREEDERS

- **Zinpro General Recommendations**
- **Infectious Diseases Challenges**
- **Sustainability**
- **Genetic Breeder Lines**

TURKEY BREEDERS

General Recommendations



BROILERS
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TURKEYS
TURKEY BREEDERS

Zinpro General Recommendations

Infectious Diseases Challenges

Sustainability

Genetic Breeder Lines



Trace Mineral, ppm^{1,2,3}

Turkey Breeders	Pullets			Hens		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic
Zn	110	50	60	110	40	70
	(90-120)	(40-60)	(50-60)	(90-110)	(40-60)	(50-70)
Mn	110	50	60	110	40	70
	(90-120)	(50-60)	(50-60)	(90-110)	(40-60)	(50-70)
Cu	15	9	6	15	7	8
	(15-20)	(9-12)	(6-8)	(7-15)	(5-7)	(8-10)
Fe	35	35	0	35	35	0
	(30-40)	(30-40)	(0-10)	(30-50)	(30-50)	(0-10)
Se	0.4	0.3	0.1	0.4	0.3	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)
I	2	0	2	3	0	3
	(2-4)	(0)	(2-4)	(2-4)	(0)	(2-4)
Cr	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹ Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

² If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

³ In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴ Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

 Zinpro General Recommendations

TURKEY BREEDERS

Infectious Diseases Challenges



BROILERS

BREEDERS

LAYERS

TURKEYS

TURKEY BREEDERS

Zinpro General Recommendations

■ Infectious Diseases Challenges

Sustainability

Genetic Breeder Lines

Trace Mineral, ppm^{1,2,3}

Turkey Breeders	Pullets			Hens		
	Total	Zinpro	Inorganic ⁴	Total	Zinpro	Inorganic
Zn	110	60	50	110	60	50
	(90-120)	(60-80)	(40-50)	(90-110)	(60-80)	(40-50)
Mn	110	50	60	110	40	70
	(90-120)	(50-60)	(50-60)	(90-110)	(40-60)	(50-70)
Cu	15	9	6	15	7	8
	(15-20)	(9-12)	(6-8)	(7-15)	(5-7)	(8-10)
Fe	35	35	0	35	35	0
	(30-40)	(30-40)	(0-10)	(30-50)	(30-50)	(0-10)
Se	0.4	0.3	0.1	0.4	0.3	0.1
	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)
I	2	0	2	3	0	3
	(2-4)	(0)	(2-4)	(2-4)	(0)	(2-4)
Cr	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹ Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

² If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, and Zinpro levels should be maintained as stated.

³ In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

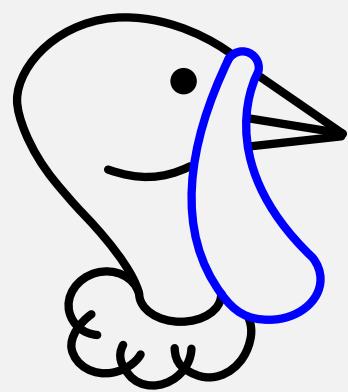
⁴ Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

 Zinpro General Recommendations

 Levels and/or ranges that vary from the Turkey Breeders General Recommendations Table

TURKEY BREEDERS

Sustainability



BROILERS
BREEDERS
LAYERS
TURKEYS

TURKEY BREEDERS
Zinpro General Recommendations
Infectious Diseases Challenges
Sustainability



Trace Mineral, ppm^{1,2,3,5}

Turkey Breeders	Pullets			Hens		
	Total	Zinpro	Inorganic⁴	Total	Zinpro	Inorganic
Zn	90	60	30	90	60	30
	(80-100)	(50-70)	(30-50)	(80-100)	(50-70)	(30-50)
Mn	100	60	40	100	60	40
	(90-110)	(50-70)	(30-50)	(90-110)	(50-70)	(30-50)
Cu	15.0	10.5	4.5	15.0	10.5	4.5
	(15-20)	(9-12)	(4-8)	(7-15)	(9-12)	(4-8)
Fe	35	35	0	35	35	0
	(30-40)	(30-40)	(0-10)	(30-50)	(30-50)	(0-10)
Se	0.40	0.30	0.10	0.40	0.30	0.10
	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)	(0.3-0.4)	(0.2-0.3)	(0.1-0.15)
I	2	0	2	3	0	3
	(2-4)	(0)	(2-4)	(2-4)	(0)	(2-4)
Cr	0.3	0.3	0	0.3	0.3	0
	(0-0.3)	(0-0.3)	(0)	(0-0.3)	(0-0.3)	(0)

¹ Total levels should be used from inorganic sources in case Zinpro product is not registered/approved in an area.

² If values exceed country legal limits for trace mineral supplementation, the total level should be adjusted to the legal limit by decreasing the inorganic levels, Zinpro levels should be maintained as stated.

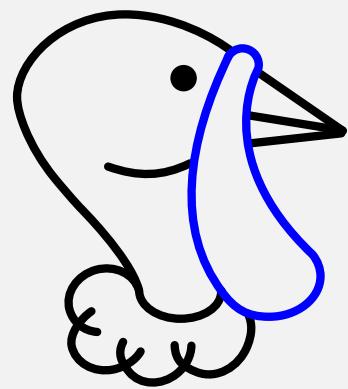
³ In the case of selenium for the EU, the maximum organic selenium limit should be met from Zinpro Availa Se and the remainder by inorganic selenium.

⁴ Inorganic: due to their oxidative reactions in the gut, ideally oxides should not be used.

⁵ To be used along with regular dose or super-dose of phytase in the diets.

 Zinpro General Recommendations

 Levels and/or ranges that vary from the Turkey Breeders General Recommendations Table



TURKEY BREEDERS

Genetic Breeder Lines

BROILERS

BREEDERS

LAYERS

TURKEYS

TURKEY BREEDERS

Zinpro General Recommendations

Infectious Diseases Challenges

Sustainability

■ **Genetic Breeder Lines**



Trace Mineral, ppm

Turkey Breeders	Pullets		Hens	
	Aviagen ¹	Hybrid ²	Aviagen	Hybrid
Zn	80-110	90-100	110	100
Mn	110-120	90-100	120	100
Cu	15	10-15	15	15
Fe	40-45	40-60	45	60
Se	0.3-0.4	0.3	0.4	0.3
I	2-3	2-3	3	3
Cr	—	—	—	—

¹Aviagen, NU18/EN version 2 - 2018.

²Hybrid-Hendrix Genetics, VTS_PS_E_L_09_16.



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