

Sample Information Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

| | | | | | |
|-----------------|------------------|-------------------|------------|------------------|------------|
| Lab code: | NW23-0398045-001 | Date of delivery: | 2023-05-23 | Date of release: | 2023-05-23 |
| Material Type: | Raw Materials | Material: | Fish Meal | Phase: | |
| Origin Country: | Kenya | Origin Subregion: | - | Origin Province: | - |

Description:

Description 1: AminoNIR 1 Fish Meal Sample JKUAT(Fish meal-T25)



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398045-001

Material: Fish Meal

Description:

Results of amino acid analysis

| Parameter | Content (% as is) | Content (%)* | Content (% in CP) |
|-------------------------|-------------------|--------------|-------------------|
| Dry matter | 88.42 | | |
| CP ** | 67.27 | 69.24 | |
| Methionine | 1.729 | 1.779 | 2.57 |
| Cystine | 0.581 | 0.598 | 0.864 |
| Methionine + Cystine ** | 2.222 | 2.287 | 3.304 |
| Lysine | 5.128 | 5.278 | 7.624 |
| Threonine | 2.637 | 2.714 | 3.92 |
| Tryptophan | 0.624 | 0.643 | 0.928 |
| Arginine | 3.986 | 4.103 | 5.926 |
| Isoleucine | 2.708 | 2.787 | 4.026 |
| Leucine | 4.671 | 4.807 | 6.943 |
| Valine | 3.094 | 3.185 | 4.6 |
| Histidine | 1.376 | 1.416 | 2.045 |
| Phenylalanine | 2.56 | 2.635 | 3.805 |
| Glycine | 4.543 | 4.676 | 6.753 |
| Serine | 2.474 | 2.547 | 3.678 |
| Proline | 2.977 | 3.064 | 4.426 |
| Alanine | 4.252 | 4.376 | 6.321 |
| Aspartic acid | 6.046 | 6.223 | 8.988 |
| Glutamic acid | 8.743 | 8.998 | 12.997 |
| NH3 | 1.029 | 1.059 | 1.529 |
| Sum including NH3 ** | 59.03 | 60.755 | 87.751 |
| Sum without NH3 ** | 57.926 | 59.619 | 86.11 |

* DMS: Figures standardized to a dry matter content of 91%, CP = Crude protein, calibration based on Dumas combustion method (CP factor 6.25)

** estimated with separate calibration equation

NIRS calibration equation: agFISH36_177473_v10



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Dr. I. Reimann



Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398045-001

Material: Fish Meal

Description:

Standardized ileal digestible amino acid content (Pig)

| Parameter | Content (% as is) | Content (%)* |
|-------------------------|-------------------|--------------|
| Methionine | 1.521 | 1.566 |
| Cystine | 0.442 | 0.455 |
| Methionine + Cystine ** | 1.867 | 1.921 |
| Lysine | 4.564 | 4.698 |
| Threonine | 2.294 | 2.361 |
| Tryptophan | 0.543 | 0.559 |
| Arginine | 3.707 | 3.816 |
| Isoleucine | 2.41 | 2.481 |
| Leucine | 4.157 | 4.278 |
| Valine | 2.723 | 2.803 |
| Histidine | 1.197 | 1.232 |
| Phenylalanine | 2.227 | 2.292 |

* DMS: Figures standardized to a dry matter content of 91%

** estimated with separate calibration equation



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398045-001

Material: Fish Meal

Description:

Standardized ileal digestible amino acid content (Broiler)

| Parameter | Content (% as is) | Content (%)* |
|-------------------------|-------------------|--------------|
| Methionine | 1.487 | 1.53 |
| Cystine | 0.355 | 0.365 |
| Methionine + Cystine ** | 1.711 | 1.761 |
| Lysine | 4.359 | 4.487 |
| Threonine | 2.136 | 2.199 |
| Tryptophan | 0.493 | 0.508 |
| Arginine | 3.388 | 3.487 |
| Isoleucine | 2.275 | 2.341 |
| Leucine | 3.97 | 4.086 |
| Valine | 2.537 | 2.612 |
| Histidine | 1.114 | 1.147 |
| Phenylalanine | 2.125 | 2.187 |
| Glycine | 3.68 | 3.787 |
| Serine | 2.054 | 2.114 |
| Proline | 2.411 | 2.482 |
| Alanine | 3.657 | 3.764 |
| Aspartic acid | 4.716 | 4.854 |
| Glutamic acid | 7.519 | 7.739 |

* DMS: Figures standardized to a dry matter content of 91%

** estimated with separate calibration equation



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Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398045-001

Material: Fish Meal

Description:

AMINONIR® Prox

| Parameter | Content (% as is) | Content (%)* |
|--------------------|-------------------|--------------|
| Dry matter | 88.42 | |
| CP ** | 67.27 | 69.24 |
| Ether Extract | 9.2 | 9.5 |
| Crude Ash | 18.4 | 18.9 |
| Phosphorus (mg/kg) | 23083 | 23757 |

* DMS: Figures standardized to a dry matter content of 91%, CP = Crude protein, calibration based on Dumas combustion method (CP factor 6.25)

** estimated with separate calibration equation

NIRS calibration equation: pgFISH31_199473_v7



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398045-001

Material:

Fish Meal

Description:

AMINONIR® NRG

| Parameter | Content (as is) | Content * |
|--|-----------------|-----------|
| Gross Energy (GE) [MJ/kg] | 18.328 | 18.864 |
| Gross Energy (GE_KCAL) [kcal/kg] | 4378 | 4506 |
| Digestible Energy Growing Pigs (DE_GP) [MJ/kg] | 15.271 | 15.717 |
| Digestible Energy Growing Pigs (DE_GP_KCAL) [kcal/kg] | 3647 | 3754 |
| Digestible Energy Sows (DE_S) [MJ/kg] | 15.271 | 15.717 |
| Digestible Energy Sows (DE_S_KCAL) [kcal/kg] | 3647 | 3754 |
| Metabolisable Energy Growing Pigs (ME_GP) [MJ/kg] | 13.82 | 14.224 |
| Metabolisable Energy Growing Pigs (ME_GP_KCAL) [kcal/kg] | 3301 | 3397 |
| Metabolisable Energy Sows (ME_S) [MJ/kg] | 13.82 | 14.224 |
| Metabolisable Energy Sows (ME_S_KCAL) [kcal/kg] | 3301 | 3397 |
| Net Energy Growing Pigs (NE_GP) [MJ/kg] | 8.68 | 8.933 |
| Net Energy Growing Pigs (NE_GP_KCAL) [kcal/kg] | 2073 | 2134 |
| Net Energy Sows (NE_S) [MJ/kg] | 8.68 | 8.933 |
| Net Energy Sows (NE_S_KCAL) [kcal/kg] | 2073 | 2134 |
| Apparent Metabolisable Energy (AME _n) [MJ/kg] | 12.267 | 12.626 |
| Apparent Metabolisable Energy (AME _n _KCAL) [kcal/kg] | 2930 | 3016 |

* DMS: Figures standardized to a dry matter content of 91%



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398045-001

Material:

Fish Meal

Description:

Results of fatty acid analysis / Total contents after ether extraction

| Parameter | Content (in RM) | Content (in Fat) |
|--------------------------------------|-----------------|------------------|
| Lauric acid (C12:0) | 0.008 | 0.091 |
| Tridecylic acid (C13:0) | 0.006 | 0.06 |
| Myristic acid (C14:0) | 0.479 | 5.205 |
| Iso-myristic acid (C14:Iso) | 0.006 | 0.065 |
| Myristoleic acid (C14:1n5) | 0.007 | 0.077 |
| Iso-pentadecylic acid (C15:Iso) | 0.029 | 0.311 |
| Aiso-pentadecylic acid (C15:Aiso) | 0.006 | 0.064 |
| Palmitic acid (C16:0) | 2.381 | 25.871 |
| Iso-Palmitic acid (C16:0:Iso) | 0.011 | 0.119 |
| Palmitoleic acid (C16:1n7) | 0.894 | 9.714 |
| Trans-palmitoleic acid (C16:1:trans) | 0.02 | 0.217 |
| Hexadecadienoic acid (C16:2n4) | 0.008 | 0.087 |
| 15-Methyl palmitic acid (C17:Iso) | 0.007 | 0.08 |
| Stearic acid (C18:0) | 0.815 | 8.86 |
| Iso-oleic acid (C18:1:Iso) | 0.033 | 0.361 |
| Vaccenic acid (C18:1n7) | 0.26 | 2.826 |
| Oleic acid (C18:1n9) | 2.339 | 25.415 |
| Linoleic acid (C18:2n6:cis) | 0.742 | 8.063 |
| Alpha-linolenic acid (C18:3n3) | 0.134 | 1.454 |
| Gamma-linolenic acid (C18:3n6) | 0.026 | 0.284 |
| Octadecatetraenoic acid (C18:4n3) | 0.094 | 1.017 |
| Eicosenoic acid (C20:1n9) | 0.135 | 1.464 |
| n6-Eicosadienoic acid (C20:2n6) | 0.055 | 0.6 |
| n3-Eicosatrienoic acid (C20:3n3) | 0.01 | 0.107 |
| Eicosatrienoic acid (C20:3n6) | 0.05 | 0.546 |
| Eicosatetraenoic acid (C20:4n3) | 0.04 | 0.44 |

(3/2)

NIRS calibration equation: fgFISH36_119672_v1



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398045-001

Material: Fish Meal

Description:

Results of fatty acid analysis / Total contents after ether extraction

| Parameter | Content (in RM) | Content (in Fat) |
|---|-----------------|------------------|
| Arachidonic acid (C20:4n6) | 0.06 | 0.656 |
| Eicosapentaenoic acid (EPA) (C20:5n3:EPA) | 0.123 | 1.332 |
| Erucic acid (C22:1n9) | 0.02 | 0.213 |
| Docosapentaen acid (DPA) (C22:5n3:DPA) | 0.066 | 0.721 |
| Lignoceric acid (C24:0) | 0.013 | 0.139 |
| Nervonic acid (C24:1n9) | 0.039 | 0.428 |
| Mono-unsaturated Fatty Acids | 4.091 | 44.454 |
| Poly-unsaturated Fatty Acids | 1.893 | 20.573 |
| Saturated acids | 3.333 | 36.217 |
| | | (2/2) |

NIRS calibration equation: fgFISH36_119672_v1



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Sample Information Report

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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

| | | | | | |
|-----------------|------------------|-------------------|------------|------------------|------------|
| Lab code: | NW23-0398046-001 | Date of delivery: | 2023-05-23 | Date of release: | 2023-05-23 |
| Material Type: | Raw Materials | Material: | Fish Meal | Phase: | |
| Origin Country: | Kenya | Origin Subregion: | - | Origin Province: | - |

Description:

Description 1: AminoNIR 1 Fish Meal Sample JKUAT(Fish meal-T75)



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Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398046-001

Material: Fish Meal

Description:

Results of amino acid analysis

| Parameter | Content (% as is) | Content (%)* | Content (% in CP) |
|-------------------------|-------------------|--------------|-------------------|
| Dry matter | 88.78 | | |
| CP ** | 66.75 | 68.43 | |
| Methionine | 1.72 | 1.763 | 2.577 |
| Cystine | 0.566 | 0.58 | 0.848 |
| Methionine + Cystine ** | 2.175 | 2.229 | 3.258 |
| Lysine | 5.163 | 5.293 | 7.735 |
| Threonine | 2.666 | 2.733 | 3.994 |
| Tryptophan | 0.629 | 0.645 | 0.943 |
| Arginine | 3.983 | 4.083 | 5.967 |
| Isoleucine | 2.712 | 2.78 | 4.063 |
| Leucine | 4.68 | 4.798 | 7.011 |
| Valine | 3.072 | 3.149 | 4.602 |
| Histidine | 1.365 | 1.4 | 2.046 |
| Phenylalanine | 2.542 | 2.605 | 3.807 |
| Glycine | 4.452 | 4.563 | 6.669 |
| Serine | 2.461 | 2.522 | 3.686 |
| Proline | 2.903 | 2.976 | 4.349 |
| Alanine | 4.222 | 4.328 | 6.325 |
| Aspartic acid | 6.114 | 6.267 | 9.159 |
| Glutamic acid | 8.708 | 8.926 | 13.045 |
| NH3 | 0.995 | 1.02 | 1.491 |
| Sum including NH3 ** | 58.432 | 59.896 | 87.534 |
| Sum without NH3 ** | 57.323 | 58.759 | 85.873 |

* DMS: Figures standardized to a dry matter content of 91%, CP = Crude protein, calibration based on Dumas combustion method (CP factor 6.25)

** estimated with separate calibration equation

NIRS calibration equation: agFISH36_177473_v10



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Analytical Report

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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398046-001

Material: Fish Meal

Description:

Standardized ileal digestible amino acid content (Pig)

| Parameter | Content (% as is) | Content (%)* |
|-------------------------|-------------------|--------------|
| Methionine | 1.514 | 1.552 |
| Cystine | 0.43 | 0.441 |
| Methionine + Cystine ** | 1.827 | 1.873 |
| Lysine | 4.595 | 4.711 |
| Threonine | 2.32 | 2.378 |
| Tryptophan | 0.548 | 0.561 |
| Arginine | 3.704 | 3.797 |
| Isoleucine | 2.414 | 2.474 |
| Leucine | 4.165 | 4.27 |
| Valine | 2.704 | 2.771 |
| Histidine | 1.188 | 1.218 |
| Phenylalanine | 2.211 | 2.267 |

* DMS: Figures standardized to a dry matter content of 91%

** estimated with separate calibration equation



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398046-001

Material:

Fish Meal

Description:

Standardized ileal digestible amino acid content (Broiler)

| Parameter | Content (% as is) | Content (%)* |
|-------------------------|-------------------|--------------|
| Methionine | 1.479 | 1.517 |
| Cystine | 0.345 | 0.354 |
| Methionine + Cystine ** | 1.675 | 1.717 |
| Lysine | 4.389 | 4.499 |
| Threonine | 2.16 | 2.214 |
| Tryptophan | 0.497 | 0.51 |
| Arginine | 3.386 | 3.47 |
| Isoleucine | 2.278 | 2.335 |
| Leucine | 3.978 | 4.078 |
| Valine | 2.519 | 2.582 |
| Histidine | 1.106 | 1.134 |
| Phenylalanine | 2.11 | 2.162 |
| Glycine | 3.606 | 3.696 |
| Serine | 2.042 | 2.094 |
| Proline | 2.351 | 2.41 |
| Alanine | 3.631 | 3.722 |
| Aspartic acid | 4.769 | 4.888 |
| Glutamic acid | 7.489 | 7.676 |

* DMS: Figures standardized to a dry matter content of 91%

** estimated with separate calibration equation



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398046-001

Material: Fish Meal

Description:

AMINONIR® Prox

| Parameter | Content (% as is) | Content (%)* |
|--------------------|-------------------|--------------|
| Dry matter | 88.78 | |
| CP ** | 66.75 | 68.43 |
| Ether Extract | 13.1 | 13.4 |
| Crude Ash | 16.2 | 16.6 |
| Phosphorus (mg/kg) | 19677 | 20170 |

* DMS: Figures standardized to a dry matter content of 91%, CP = Crude protein, calibration based on Dumas combustion method (CP factor 6.25)

** estimated with separate calibration equation

NIRS calibration equation: pgFISH31_199473_v7



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Analytical Report

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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398046-001

Material:

Fish Meal

Description:

AMINONIR® NRG

| Parameter | Content (as is) | Content * |
|--|-----------------|-----------|
| Gross Energy (GE) [MJ/kg] | 19.669 | 20.162 |
| Gross Energy (GE_KCAL) [kcal/kg] | 4698 | 4816 |
| Digestible Energy Growing Pigs (DE_GP) [MJ/kg] | 16.758 | 17.178 |
| Digestible Energy Growing Pigs (DE_GP_KCAL) [kcal/kg] | 4003 | 4103 |
| Digestible Energy Sows (DE_S) [MJ/kg] | 16.758 | 17.178 |
| Digestible Energy Sows (DE_S_KCAL) [kcal/kg] | 4003 | 4103 |
| Metabolisable Energy Growing Pigs (ME_GP) [MJ/kg] | 15.166 | 15.546 |
| Metabolisable Energy Growing Pigs (ME_GP_KCAL) [kcal/kg] | 3622 | 3713 |
| Metabolisable Energy Sows (ME_S) [MJ/kg] | 15.166 | 15.546 |
| Metabolisable Energy Sows (ME_S_KCAL) [kcal/kg] | 3622 | 3713 |
| Net Energy Growing Pigs (NE_GP) [MJ/kg] | 10.002 | 10.252 |
| Net Energy Growing Pigs (NE_GP_KCAL) [kcal/kg] | 2389 | 2449 |
| Net Energy Sows (NE_S) [MJ/kg] | 10.002 | 10.252 |
| Net Energy Sows (NE_S_KCAL) [kcal/kg] | 2389 | 2449 |
| Apparent Metabolisable Energy (AME _n) [MJ/kg] | 13.315 | 13.649 |
| Apparent Metabolisable Energy (AME _n _KCAL) [kcal/kg] | 3180 | 3260 |

* DMS: Figures standardized to a dry matter content of 91%



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398046-001

Material:

Fish Meal

Description:

Results of fatty acid analysis / Total contents after ether extraction

| Parameter | Content (in RM) | Content (in Fat) |
|--------------------------------------|-----------------|------------------|
| Lauric acid (C12:0) | 0.008 | 0.065 |
| Tridecylic acid (C13:0) | 0.01 | 0.075 |
| Myristic acid (C14:0) | 0.644 | 4.923 |
| Iso-myristic acid (C14:Iso) | 0.007 | 0.057 |
| Myristoleic acid (C14:1n5) | 0.008 | 0.061 |
| Iso-pentadecylic acid (C15:Iso) | 0.041 | 0.314 |
| Aiso-pentadecylic acid (C15:Aiso) | 0.008 | 0.064 |
| Palmitic acid (C16:0) | 3.348 | 25.607 |
| Iso-Palmitic acid (C16:0:Iso) | 0.015 | 0.114 |
| Palmitoleic acid (C16:1n7) | 1.234 | 9.439 |
| Trans-palmitoleic acid (C16:1:trans) | 0.02 | 0.15 |
| 15-Methyl palmitic acid (C17:Iso) | 0.008 | 0.06 |
| Stearic acid (C18:0) | 1.122 | 8.582 |
| Iso-oleic acid (C18:1:Iso) | 0.052 | 0.395 |
| Vaccenic acid (C18:1n7) | 0.378 | 2.894 |
| Oleic acid (C18:1n9) | 3.787 | 28.96 |
| Linoleic acid (C18:2n6:cis) | 1.297 | 9.922 |
| Alpha-linolenic acid (C18:3n3) | 0.229 | 1.749 |
| Gamma-linolenic acid (C18:3n6) | 0.036 | 0.276 |
| Octadecatetraenoic acid (C18:4n3) | 0.149 | 1.14 |
| Eicosenoic acid (C20:1n9) | 0.244 | 1.867 |
| n6-Eicosadienoic acid (C20:2n6) | 0.082 | 0.625 |
| n3-Eicosatrienoic acid (C20:3n3) | 0.016 | 0.123 |
| Eicosatrienoic acid (C20:3n6) | 0.081 | 0.623 |
| Eicosatetraenoic acid (C20:4n3) | 0.06 | 0.461 |
| Arachidonic acid (C20:4n6) | 0.021 | 0.16 |

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NIRS calibration equation: fgFISH36_119672_v1



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398046-001

Material: Fish Meal

Description:

Results of fatty acid analysis / Total contents after ether extraction

| Parameter | Content (in RM) | Content (in Fat) |
|--|-----------------|------------------|
| Erucic acid (C22:1n9) | 0.034 | 0.256 |
| Docosapentaen acid (DPA) (C22:5n3:DPA) | 0.059 | 0.451 |
| Lignoceric acid (C24:0) | 0.014 | 0.108 |
| Nervonic acid (C24:1n9) | 0.054 | 0.41 |
| Mono-unsaturated Fatty Acids | 7.05 | 53.915 |
| Poly-unsaturated Fatty Acids | 1.978 | 15.13 |
| Saturated acids | 4.771 | 36.489 |
| | | (2/2) |

NIRS calibration equation: fgFISH36_119672_v1



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

| | | | | | |
|-----------------|------------------|-------------------|------------|------------------|------------|
| Lab code: | NW23-0398047-001 | Date of delivery: | 2023-05-23 | Date of release: | 2023-05-23 |
| Material Type: | Raw Materials | Material: | Fish Meal | Phase: | |
| Origin Country: | Kenya | Origin Subregion: | - | Origin Province: | - |

Description:

Description 1: AminoNIR 1 Fish Meal Sample JKUAT(Fish meal-T50)



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398047-001

Material: Fish Meal

Description:

Results of amino acid analysis

| Parameter | Content (% as is) | Content (%)* | Content (% in CP) |
|-------------------------|-------------------|--------------|-------------------|
| Dry matter | 88.33 | | |
| CP ** | 67.95 | 70 | |
| Methionine | 1.784 | 1.838 | 2.626 |
| Cystine | 0.584 | 0.601 | 0.859 |
| Methionine + Cystine ** | 2.243 | 2.311 | 3.302 |
| Lysine | 5.308 | 5.468 | 7.812 |
| Threonine | 2.702 | 2.783 | 3.976 |
| Tryptophan | 0.642 | 0.662 | 0.945 |
| Arginine | 4.063 | 4.186 | 5.98 |
| Isoleucine | 2.763 | 2.846 | 4.067 |
| Leucine | 4.791 | 4.936 | 7.052 |
| Valine | 3.128 | 3.222 | 4.603 |
| Histidine | 1.397 | 1.439 | 2.055 |
| Phenylalanine | 2.597 | 2.676 | 3.823 |
| Glycine | 4.501 | 4.637 | 6.624 |
| Serine | 2.475 | 2.55 | 3.643 |
| Proline | 2.899 | 2.986 | 4.266 |
| Alanine | 4.29 | 4.419 | 6.314 |
| Aspartic acid | 6.258 | 6.447 | 9.21 |
| Glutamic acid | 8.953 | 9.223 | 13.176 |
| NH3 | 1.006 | 1.036 | 1.48 |
| Sum including NH3 ** | 59.721 | 61.522 | 87.894 |
| Sum without NH3 ** | 58.548 | 60.314 | 86.168 |

* DMS: Figures standardized to a dry matter content of 91%, CP = Crude protein, calibration based on Dumas combustion method (CP factor 6.25)

** estimated with separate calibration equation

NIRS calibration equation: agFISH36_177473_v10



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398047-001

Material: Fish Meal

Description:

Standardized ileal digestible amino acid content (Pig)

| Parameter | Content (% as is) | Content (%)* |
|-------------------------|-------------------|--------------|
| Methionine | 1.57 | 1.618 |
| Cystine | 0.444 | 0.457 |
| Methionine + Cystine ** | 1.884 | 1.941 |
| Lysine | 4.724 | 4.866 |
| Threonine | 2.351 | 2.421 |
| Tryptophan | 0.559 | 0.576 |
| Arginine | 3.779 | 3.893 |
| Isoleucine | 2.459 | 2.533 |
| Leucine | 4.264 | 4.393 |
| Valine | 2.752 | 2.835 |
| Histidine | 1.215 | 1.252 |
| Phenylalanine | 2.26 | 2.328 |

* DMS: Figures standardized to a dry matter content of 91%

** estimated with separate calibration equation



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398047-001

Material: Fish Meal

Description:

Standardized ileal digestible amino acid content (Broiler)

| Parameter | Content (% as is) | Content (%)* |
|-------------------------|-------------------|--------------|
| Methionine | 1.535 | 1.581 |
| Cystine | 0.356 | 0.367 |
| Methionine + Cystine ** | 1.727 | 1.779 |
| Lysine | 4.511 | 4.648 |
| Threonine | 2.188 | 2.254 |
| Tryptophan | 0.507 | 0.523 |
| Arginine | 3.454 | 3.558 |
| Isoleucine | 2.321 | 2.391 |
| Leucine | 4.073 | 4.196 |
| Valine | 2.565 | 2.642 |
| Histidine | 1.131 | 1.165 |
| Phenylalanine | 2.156 | 2.221 |
| Glycine | 3.646 | 3.756 |
| Serine | 2.055 | 2.117 |
| Proline | 2.348 | 2.419 |
| Alanine | 3.689 | 3.801 |
| Aspartic acid | 4.881 | 5.028 |
| Glutamic acid | 7.699 | 7.931 |

* DMS: Figures standardized to a dry matter content of 91%

** estimated with separate calibration equation



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398047-001

Material: Fish Meal

Description:

AMINONIR® Prox

| Parameter | Content (% as is) | Content (%)* |
|--------------------|-------------------|--------------|
| Dry matter | 88.33 | |
| CP ** | 67.95 | 70 |
| Ether Extract | 11.2 | 11.6 |
| Crude Ash | 16.2 | 16.7 |
| Phosphorus (mg/kg) | 20532 | 21151 |

* DMS: Figures standardized to a dry matter content of 91%, CP = Crude protein, calibration based on Dumas combustion method (CP factor 6.25)

** estimated with separate calibration equation

NIRS calibration equation: pgFISH31_199473_v7



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398047-001

Material:

Fish Meal

Description:

AMINONIR® NRG

| Parameter | Content (as is) | Content * |
|--|-----------------|-----------|
| Gross Energy (GE) [MJ/kg] | 19.238 | 19.819 |
| Gross Energy (GE_KCAL) [kcal/kg] | 4595 | 4734 |
| Digestible Energy Growing Pigs (DE_GP) [MJ/kg] | 16.484 | 16.982 |
| Digestible Energy Growing Pigs (DE_GP_KCAL) [kcal/kg] | 3937 | 4056 |
| Digestible Energy Sows (DE_S) [MJ/kg] | 16.484 | 16.982 |
| Digestible Energy Sows (DE_S_KCAL) [kcal/kg] | 3937 | 4056 |
| Metabolisable Energy Growing Pigs (ME_GP) [MJ/kg] | 14.918 | 15.369 |
| Metabolisable Energy Growing Pigs (ME_GP_KCAL) [kcal/kg] | 3563 | 3671 |
| Metabolisable Energy Sows (ME_S) [MJ/kg] | 14.918 | 15.369 |
| Metabolisable Energy Sows (ME_S_KCAL) [kcal/kg] | 3563 | 3671 |
| Net Energy Growing Pigs (NE_GP) [MJ/kg] | 9.639 | 9.93 |
| Net Energy Growing Pigs (NE_GP_KCAL) [kcal/kg] | 2302 | 2372 |
| Net Energy Sows (NE_S) [MJ/kg] | 9.639 | 9.93 |
| Net Energy Sows (NE_S_KCAL) [kcal/kg] | 2302 | 2372 |
| Apparent Metabolisable Energy (AME _n) [MJ/kg] | 12.927 | 13.317 |
| Apparent Metabolisable Energy (AME _n _KCAL) [kcal/kg] | 3088 | 3181 |

* DMS: Figures standardized to a dry matter content of 91%



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Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398047-001

Material:

Fish Meal

Description:

Results of fatty acid analysis / Total contents after ether extraction

| Parameter | Content (in RM) | Content (in Fat) |
|--------------------------------------|-----------------|------------------|
| Lauric acid (C12:0) | 0.008 | 0.075 |
| Tridecylic acid (C13:0) | 0.008 | 0.068 |
| Myristic acid (C14:0) | 0.607 | 5.414 |
| Iso-myristic acid (C14:Iso) | 0.007 | 0.064 |
| Myristoleic acid (C14:1n5) | 0.008 | 0.067 |
| Iso-pentadecylic acid (C15:Iso) | 0.037 | 0.326 |
| Aiso-pentadecylic acid (C15:Aiso) | 0.007 | 0.064 |
| Palmitic acid (C16:0) | 2.967 | 26.446 |
| Iso-Palmitic acid (C16:0:Iso) | 0.014 | 0.12 |
| Palmitoleic acid (C16:1n7) | 1.128 | 10.054 |
| Trans-palmitoleic acid (C16:1:trans) | 0.017 | 0.155 |
| 15-Methyl palmitic acid (C17:Iso) | 0.008 | 0.068 |
| Stearic acid (C18:0) | 0.994 | 8.858 |
| Iso-oleic acid (C18:1:Iso) | 0.044 | 0.392 |
| Vaccenic acid (C18:1n7) | 0.324 | 2.888 |
| Oleic acid (C18:1n9) | 3.002 | 26.755 |
| Linoleic acid (C18:2n6:cis) | 0.991 | 8.829 |
| Alpha-linolenic acid (C18:3n3) | 0.178 | 1.582 |
| Gamma-linolenic acid (C18:3n6) | 0.032 | 0.288 |
| Octadecatetraenoic acid (C18:4n3) | 0.119 | 1.056 |
| Eicosenoic acid (C20:1n9) | 0.181 | 1.618 |
| n6-Eicosadienoic acid (C20:2n6) | 0.066 | 0.588 |
| n3-Eicosatrienoic acid (C20:3n3) | 0.013 | 0.114 |
| Eicosatrienoic acid (C20:3n6) | 0.067 | 0.595 |
| Eicosatetraenoic acid (C20:4n3) | 0.05 | 0.443 |
| Arachidonic acid (C20:4n6) | 0.037 | 0.331 |

(3/2)

NIRS calibration equation: fgFISH36_119672_v1



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398047-001

Material: Fish Meal

Description:

Results of fatty acid analysis / Total contents after ether extraction

| Parameter | Content (in RM) | Content (in Fat) |
|---|-----------------|------------------|
| Eicosapentaenoic acid (EPA) (C20:5n3:EPA) | 0.106 | 0.946 |
| Erucic acid (C22:1n9) | 0.026 | 0.236 |
| Docosapentaen acid (DPA) (C22:5n3:DPA) | 0.066 | 0.587 |
| Lignoceric acid (C24:0) | 0.015 | 0.133 |
| Nervonic acid (C24:1n9) | 0.048 | 0.424 |
| Mono-unsaturated Fatty Acids | 5.494 | 48.962 |
| Poly-unsaturated Fatty Acids | 1.901 | 16.941 |
| Saturated acids | 4.242 | 37.804 |

(2/2)

NIRS calibration equation: fgFISH36_119672_v1



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Sample Information Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

| | | | | | |
|-----------------|------------------|-------------------|------------|------------------|------------|
| Lab code: | NW23-0398053-001 | Date of delivery: | 2023-05-23 | Date of release: | 2023-05-23 |
| Material Type: | Raw Materials | Material: | Fish Meal | Phase: | |
| Origin Country: | Kenya | Origin Subregion: | - | Origin Province: | - |

Description:

Description 1: AminoNIR 1 Fish Meal Sample JKUAT(Fish meal-T0)



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398053-001

Material: Fish Meal

Description:

Results of amino acid analysis

| Parameter | Content (% as is) | Content (%)* | Content (% in CP) |
|-------------------------|-------------------|--------------|-------------------|
| Dry matter | 88.53 | | |
| CP ** | 65.65 | 67.48 | |
| Methionine | 1.675 | 1.722 | 2.552 |
| Cystine | 0.556 | 0.571 | 0.847 |
| Methionine + Cystine ** | 2.124 | 2.183 | 3.235 |
| Lysine | 5.015 | 5.154 | 7.638 |
| Threonine | 2.598 | 2.67 | 3.957 |
| Tryptophan | 0.605 | 0.622 | 0.922 |
| Arginine | 3.918 | 4.027 | 5.968 |
| Isoleucine | 2.626 | 2.7 | 4.001 |
| Leucine | 4.562 | 4.689 | 6.949 |
| Valine | 2.993 | 3.076 | 4.558 |
| Histidine | 1.339 | 1.376 | 2.039 |
| Phenylalanine | 2.485 | 2.555 | 3.786 |
| Glycine | 4.552 | 4.679 | 6.934 |
| Serine | 2.399 | 2.466 | 3.655 |
| Proline | 2.95 | 3.032 | 4.494 |
| Alanine | 4.181 | 4.298 | 6.369 |
| Aspartic acid | 5.905 | 6.069 | 8.994 |
| Glutamic acid | 8.5 | 8.737 | 12.947 |
| NH3 | 0.986 | 1.013 | 1.501 |
| Sum including NH3 ** | 57.276 | 58.874 | 87.244 |
| Sum without NH3 ** | 56.224 | 57.793 | 85.642 |

* DMS: Figures standardized to a dry matter content of 91%, CP = Crude protein, calibration based on Dumas combustion method (CP factor 6.25)

** estimated with separate calibration equation

NIRS calibration equation: agFISH36_177473_v10



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398053-001

Material: Fish Meal

Description:

Standardized ileal digestible amino acid content (Pig)

| Parameter | Content (% as is) | Content (%)* |
|-------------------------|-------------------|--------------|
| Methionine | 1.474 | 1.515 |
| Cystine | 0.422 | 0.434 |
| Methionine + Cystine ** | 1.784 | 1.834 |
| Lysine | 4.463 | 4.587 |
| Threonine | 2.26 | 2.323 |
| Tryptophan | 0.527 | 0.541 |
| Arginine | 3.644 | 3.745 |
| Isoleucine | 2.338 | 2.403 |
| Leucine | 4.06 | 4.173 |
| Valine | 2.633 | 2.707 |
| Histidine | 1.165 | 1.197 |
| Phenylalanine | 2.162 | 2.223 |

* DMS: Figures standardized to a dry matter content of 91%

** estimated with separate calibration equation



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Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398053-001

Material: Fish Meal

Description:

Standardized ileal digestible amino acid content (Broiler)

| Parameter | Content (% as is) | Content (%)* |
|-------------------------|-------------------|--------------|
| Methionine | 1.441 | 1.481 |
| Cystine | 0.339 | 0.349 |
| Methionine + Cystine ** | 1.635 | 1.681 |
| Lysine | 4.262 | 4.381 |
| Threonine | 2.104 | 2.163 |
| Tryptophan | 0.478 | 0.491 |
| Arginine | 3.33 | 3.423 |
| Isoleucine | 2.206 | 2.268 |
| Leucine | 3.878 | 3.986 |
| Valine | 2.454 | 2.522 |
| Histidine | 1.084 | 1.115 |
| Phenylalanine | 2.063 | 2.12 |
| Glycine | 3.687 | 3.79 |
| Serine | 1.991 | 2.047 |
| Proline | 2.39 | 2.456 |
| Alanine | 3.596 | 3.696 |
| Aspartic acid | 4.606 | 4.734 |
| Glutamic acid | 7.31 | 7.514 |

* DMS: Figures standardized to a dry matter content of 91%

** estimated with separate calibration equation



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398053-001

Material: Fish Meal

Description:

AMINONIR® Prox

| Parameter | Content (% as is) | Content (%)* |
|--------------------|-------------------|--------------|
| Dry matter | 88.53 | |
| CP ** | 65.65 | 67.48 |
| Ether Extract | 12.6 | 12.9 |
| Crude Ash | 17.2 | 17.7 |
| Phosphorus (mg/kg) | 23508 | 24164 |

* DMS: Figures standardized to a dry matter content of 91%, CP = Crude protein, calibration based on Dumas combustion method (CP factor 6.25)

** estimated with separate calibration equation

NIRS calibration equation: pgFISH31_199473_v7



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398053-001

Material:

Fish Meal

Description:

AMINONIR® NRG

| Parameter | Content (as is) | Content * |
|--|-----------------|-----------|
| Gross Energy (GE) [MJ/kg] | 19.264 | 19.801 |
| Gross Energy (GE_KCAL) [kcal/kg] | 4601 | 4729 |
| Digestible Energy Growing Pigs (DE_GP) [MJ/kg] | 16.182 | 16.633 |
| Digestible Energy Growing Pigs (DE_GP_KCAL) [kcal/kg] | 3865 | 3973 |
| Digestible Energy Sows (DE_S) [MJ/kg] | 16.182 | 16.633 |
| Digestible Energy Sows (DE_S_KCAL) [kcal/kg] | 3865 | 3973 |
| Metabolisable Energy Growing Pigs (ME_GP) [MJ/kg] | 14.645 | 15.053 |
| Metabolisable Energy Growing Pigs (ME_GP_KCAL) [kcal/kg] | 3498 | 3595 |
| Metabolisable Energy Sows (ME_S) [MJ/kg] | 14.645 | 15.053 |
| Metabolisable Energy Sows (ME_S_KCAL) [kcal/kg] | 3498 | 3595 |
| Net Energy Growing Pigs (NE_GP) [MJ/kg] | 9.607 | 9.875 |
| Net Energy Growing Pigs (NE_GP_KCAL) [kcal/kg] | 2295 | 2359 |
| Net Energy Sows (NE_S) [MJ/kg] | 9.607 | 9.875 |
| Net Energy Sows (NE_S_KCAL) [kcal/kg] | 2295 | 2359 |
| Apparent Metabolisable Energy (AME _n) [MJ/kg] | 13.054 | 13.418 |
| Apparent Metabolisable Energy (AME _n _KCAL) [kcal/kg] | 3118 | 3205 |

* DMS: Figures standardized to a dry matter content of 91%



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398053-001

Material:

Fish Meal

Description:

Results of fatty acid analysis / Total contents after ether extraction

| Parameter | Content (in RM) | Content (in Fat) |
|--------------------------------------|-----------------|------------------|
| Lauric acid (C12:0) | 0.008 | 0.061 |
| Tridecylic acid (C13:0) | 0.008 | 0.067 |
| Myristic acid (C14:0) | 0.658 | 5.23 |
| Iso-myristic acid (C14:Iso) | 0.007 | 0.058 |
| Myristoleic acid (C14:1n5) | 0.009 | 0.071 |
| Iso-pentadecylic acid (C15:Iso) | 0.039 | 0.309 |
| Aiso-pentadecylic acid (C15:Aiso) | 0.008 | 0.064 |
| Palmitic acid (C16:0) | 3.333 | 26.508 |
| Iso-Palmitic acid (C16:0:Iso) | 0.015 | 0.115 |
| Palmitoleic acid (C16:1n7) | 1.182 | 9.404 |
| Trans-palmitoleic acid (C16:1:trans) | 0.018 | 0.139 |
| 15-Methyl palmitic acid (C17:Iso) | 0.007 | 0.053 |
| Stearic acid (C18:0) | 1.14 | 9.071 |
| Iso-oleic acid (C18:1:Iso) | 0.051 | 0.405 |
| Vaccenic acid (C18:1n7) | 0.325 | 2.589 |
| Oleic acid (C18:1n9) | 3.561 | 28.322 |
| Linoleic acid (C18:2n6:cis) | 1.21 | 9.628 |
| Alpha-linolenic acid (C18:3n3) | 0.189 | 1.507 |
| Gamma-linolenic acid (C18:3n6) | 0.035 | 0.281 |
| Octadecatetraenoic acid (C18:4n3) | 0.133 | 1.061 |
| Eicosenoic acid (C20:1n9) | 0.219 | 1.743 |
| n6-Eicosadienoic acid (C20:2n6) | 0.076 | 0.606 |
| n3-Eicosatrienoic acid (C20:3n3) | 0.014 | 0.115 |
| Eicosatrienoic acid (C20:3n6) | 0.08 | 0.633 |
| Eicosatetraenoic acid (C20:4n3) | 0.052 | 0.414 |
| Arachidonic acid (C20:4n6) | 0.045 | 0.361 |

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NIRS calibration equation: fgFISH36_119672_v1



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Analytical Report

Evonik East Africa (Kenya) (63790), Nairobi, Kenya

Lab Customer: Evonik East Africa (Kenya-Nairobi), Nairobi, 56039

Lab code: NW23-0398053-001

Material: Fish Meal

Description:

Results of fatty acid analysis / Total contents after ether extraction

| Parameter | Content (in RM) | Content (in Fat) |
|---|-----------------|------------------|
| Eicosapentaenoic acid (EPA) (C20:5n3:EPA) | 0.035 | 0.279 |
| Erucic acid (C22:1n9) | 0.029 | 0.233 |
| Docosapentaen acid (DPA) (C22:5n3:DPA) | 0.053 | 0.423 |
| Lignoceric acid (C24:0) | 0.012 | 0.096 |
| Nervonic acid (C24:1n9) | 0.054 | 0.432 |
| Mono-unsaturated Fatty Acids | 6.317 | 50.248 |
| Poly-unsaturated Fatty Acids | 1.994 | 15.862 |
| Saturated acids | 4.599 | 36.581 |

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NIRS calibration equation: fgFISH36_119672_v1



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