A piece of home.

A piece of home.

DEUTSCHE PELLETS

The Company – VZR Verfahrenszentrum Reichstädt GmbH

DEUTSCHE PELLETS

The Process of Wood Oil – WDTA Innovative Technologie

Patent- & Gebrauchsmusteranmeldung Akz.: 10 2014 013 762.7

- Continuous drying process of shavings in two parallel working vapour-fluid-dryer in 105 to 120° C.
- Drying by exclusion of air with final water content of 4-6 wt%.
- Energy for drying comes from two natural gas steam generators (steam of heating p=20bar).

DEUTSCHE PELLETS

Unique, patented process for the extraction of sterile essential oil, hydrolates and hygienic products for animal husbandry

- Process and device for the extraction of essential oil and hydrolates from biogenic plant material
- Patent & registered design application Akz.: 10 2014 013 762.7
- advantages:
  - By products of the extraction of essential oil are being reused and by pressing them into sterile pellets
  - Continuous process
  - Energy saving extraction of essential oils
  - Extraction of oils via water vapour drying and subsequently distillation of the waste steam and azeotropic phase separation
  - 100 % natural, sterile, essential oil is extracted

Patent claims

1. Procedure to produce essential oils from biogenic raw plant material, wherein the delivered raw biomass is processed into biogenic raw material and then broken down with a steam distillation and dried, which leads to a separation of liquid and solid phase. This process is **characterised that** the liquid phase after leaving the steam distillation as waste steam is condensed and via azeotropic phase separation separated into completely sterile essential oil and water distillate, whereas the solid phase is processed into completely sterile solid molded bodies, like pellets, granule and so on. The steam distillation is done in a continuously working process, in which the biogenic raw material is treated at 120°C for at least 30 minutes, which leads to the solid phase being dried down during this thermic treatment in a pure water vapor environment from a starting moisture of 35-55 wt% to a final moisture of 4-7 wt%.

Patent claims

2. The produced essential oil is absolutely sterile and 100% natural.

3. Treatment with steam distillation as well as the condensation of the waste steam can be done isothermal. With this procedure it is possible that the heat needed for the distillation can be recovered almost completely during the condensation of the waste steam and thus be lead into the system again.

Patent claims

4. Device to produce essential oil from biogenic raw plant material with a biomass processing module (BE 2) for the processing of the delivered raw biomass into biogenic raw material, and a steam distillation and drying module (BE 3) which is fed with the biogenic raw material, **characterized by** a condensation module for waste steam (BE 6) for the liquid phase coming from the steam distillation and drying module (BE 3) to be processed into completely sterile essential oils and water distillate and a processing module (BE 4) for the solid phase to produce solid molded bodies like pellets, granule or others from the solid phase coming from the steam distillation and drying module (BE 3), which leads to completely sterile, almost dust free solid molded bodies, whereby the steam distillation and drying module (BE 3) is working continuously.

Patent claims

5. Device according to claim 4, **characterized by** the essential oil being completely sterile and a 100% natural.

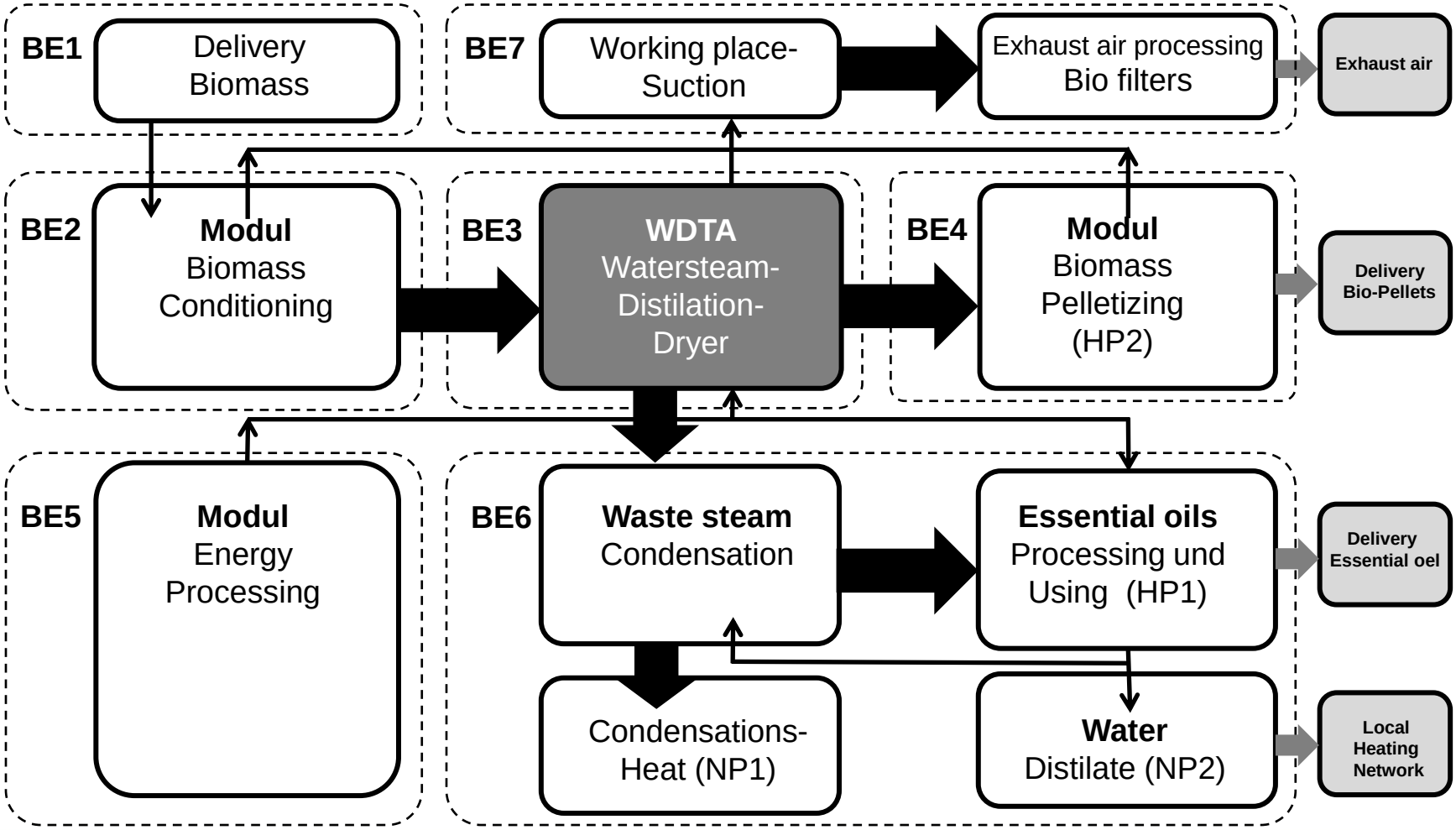
6. Device according to claim 4 or 5, **characterized by** the agitator being placed within the steam distillation an drying module (BE 3), which leads to a steady mechanical fluidization so that a fluidic bed like state of the solid phase is achieved, leading to very good values for mass and heat transfer within the steam distillation and drying module (BE 3).

7. Device according to the claim 4 to 6, characterized by the steam distillation and drying module (BE 3) being equipped with a heat jacket, which conducts the heat energy indirectly onto the biogenic raw material which need heating.

DEUTSCHE PELLETS

The Process to Wood Oil – WDTA Innovative Technologie

Patent- & Gebrauchsmusteranmeldung Akz.: 10 2014 013 762.7

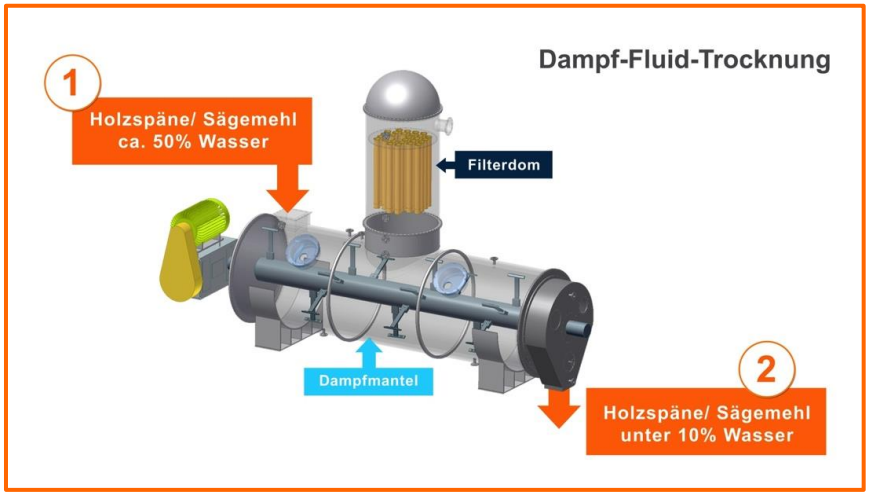


DEUTSCHE PELLETS

The processing of wood oil – WDTA innovative technology

Patent- & Gebrauchsmusteranmeldung Akz.: 10 2014 013 762.7

- Indirect introduction of heat energy into heat jacket during the drying process.
- Filter cloth is clearing the steam and condenses it in double step condensation columns, the vaporized oil from the drying process is also condensed in this step.
- production of **HÖS Holzöl-Sumpf** (by condenser sump) and production of **HÖK Holzöl-Kopf** (by condenser head) and **natural wood water.**

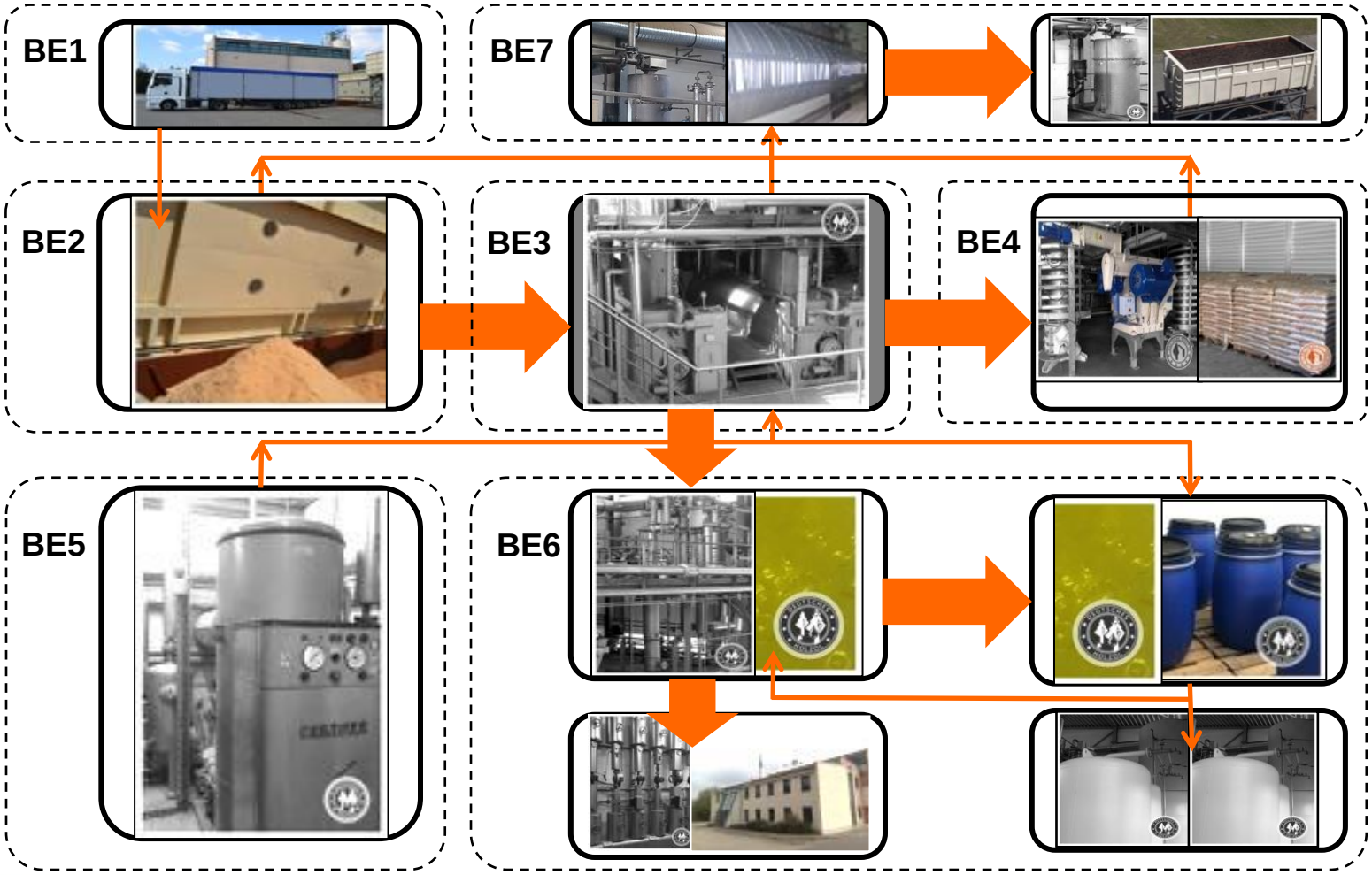


WDTA Schema

DEUTSCHE PELLETS

The Process to Wood Oil – WDTA Innovative Technologie

Patent- & Gebrauchsmusteranmeldung Akz.: 10 2014 013 762.7



WEITER

DEUTSCHE PELLETS

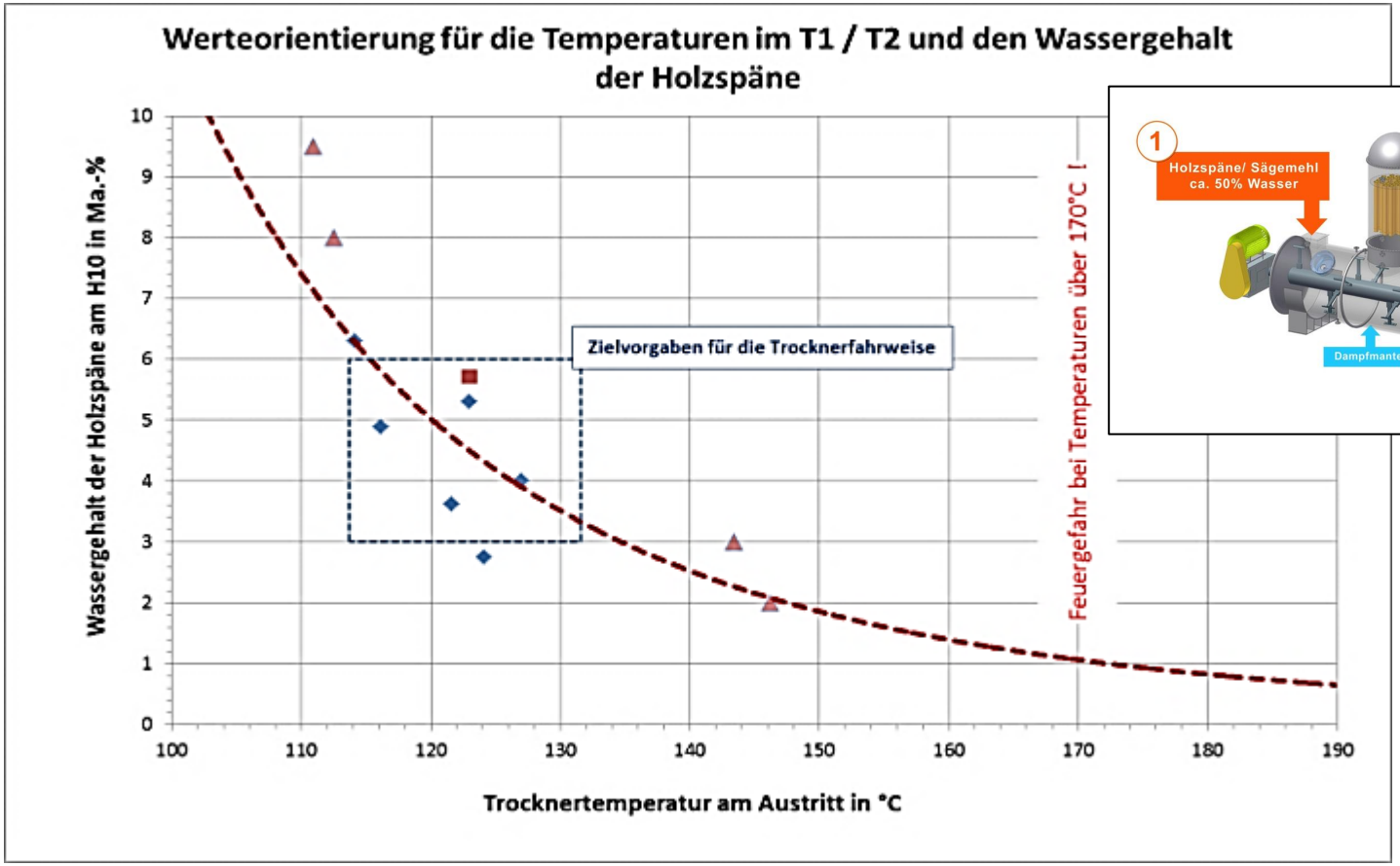
The raw material – Wood shavings

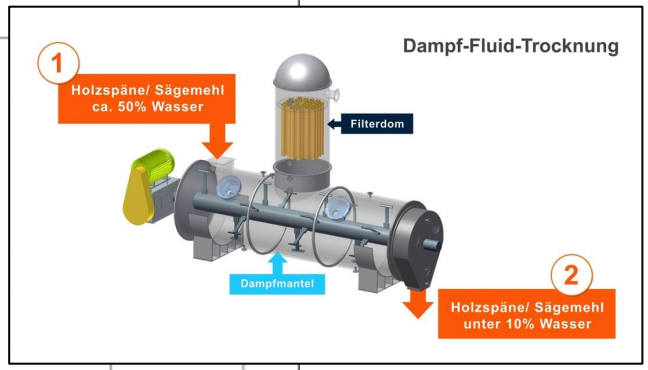
- Daily processing of 90-100 m^3 wood shavings with an average water content of 45%.
- Visual and laboratory sampling guarantee a stable quality of our products

DEUTSCHE PELLETS

The processing of wood oil – WDTA innovative technology

Patent- & Gebrauchsmusteranmeldung Akz.: 10 2014 013 762.7





WDTA Schema

Natürlich stark!

MÄRKISCHES KIEFERNWASSER

ALLES IST GUT, WIE ES AUS DEN HÄNDEN DER NATUR KOMMT.

JOHANN WOLFGANG VON GOETHE (1749 - 1832)

DEUTSCHES HOLZWASSER

Produkt Nr.2 – DEUTSCHES HOLZWASSER

- Tägliche Aufbereitung von
  7000 -9000 Liter Holzwasser
  (Destillat)
  mit leicht typischen Holzgeruch
- Nutzung als:
  - Pflanzenstärkungsmittel
  - Glas- und Flächenreiniger
  - Tierpflegemittel

DEUTSCHES HOLZWASSER

Das Produkt MÄRKISCHES KIEFERNWASSER

- MÄRKISCHES KIEFERNWASSER wird derzeit als Pflanzenstärkungsmittel zugelassen
- Untersuchungen am Julius-Kühn-Institut und an der TU Dresden
- Verhilft Pflanzen zu mehr Vitalität, kräftigem Wuchs und gesundem Blattgrün
- Stärkt die pflanzeneigene Abwehr und vertreibt so Parasiten und Schädlinge
- Zum Besprühen und Gießen der Pflanzen

DEUTSCHES HOLZWASSER

Das Produkt MÄRKISCHES KIEFERNWASSER

- MÄRKISCHES KIEFERNWASSER eignet sich als natürliches Reinigungsmittel für den Haushalt
- Reinigt alle glatten Oberflächen wie Glas, Edelstahl, Keramik etc.
- Entfernt auch hartnäckige Ablagerungen und sorgt dank der pflanzeneigenen Inhaltsstoffe der Kiefer für eine Desinfektion der Oberflächen
- Fenster und Spiegel profitieren von der Reinigung und erstrahlen wieder in streifenfreiem Glanz

Vorher

Nachher

DEUTSCHES HOLZWASSER

Das Produkt MÄRKISCHES KIEFERNWASSER

- MÄRKISCHES KIEFERNWASSER hilft auch Tieren, gesund zu bleiben
- Die antiseptische Wirkung des Kiefernwassers vertreibt Schädlinge und Parasiten und stärkt die körpereigene Abwehr
- Hilft bei Schweifjucken, kleineren Verletzungen und Entzündungen, Insekten- und Milbenbefall
- Steigert das Wohlbefinden bei Bienen und Haustieren




Well of natural oil!

MÄRKISCHES KIEFERNÖL

ALLES IST GUT, WIE ES AUS DEN HÄNDEN DER NATUR KOMMT.

JOHANN WOLFGANG VON GOETHE (1749 - 1832)

DEUTSCHES HOLZÖL

Product no.1 – DEUTSCHES HOLZÖL essential oil

- production of wood oil sump and wood oil head.
- Both oils have a density of 0,8 – 0,85 g/ml, so it's easy to isolate them from the water phase.

DEUTSCHES HOLZÖL

product no.1 – DEUTSCHES HOLZÖL essential oil

HÖS- wood oil sump

- Color ranges from fawn to light yellow and glassy.
- Smell is similar to that of conifer wood plants.

HÖK-wood oil head

- color ranges from colorless to light yellow and also glassy.
- Smell is similar to that of conifer wood.

DEUTSCHES HOLZÖL

product no.1 – DEUTSCHES HOLZÖL essential oil

- Currently we are producing 5 liters of essential oil per hour.
- That means a daily production of 120 liters of oil with constant high quality.
- Is 100% natural oil without any additions.

DEUTSCHES HOLZÖL

The Product Nr.1 – DEUTSCHES HOLZÖL essential oil

- Can be used in wellness and for nature cosmetics.
- In products for furniture, wood and laminated plastic ground care.
- very successful in household cleaning.

DEUTSCHES HOLZÖL

Das Produkt MÄRKISCHES KIEFERNÖL

- REACH Vorregistrierungs-Nr.:

  17-2120052822-60-0000

- Biozid-Registrierung läuft derzeit

100% sterile natural wood pellets

A piece of home.

Naturally dry – stable comfort.

DEUTSCHE EINSTREU

Holzpellets als Hygienematerial für die Tierhaltung

- **Sächsische Pellet- Herstellung aus heimisch unbehandelten Restholz** und nachhaltiger Forstwirtschaft – PEFC

- **Reines Naturprodukt –**
  Keine chemischen und keine natürlichen Zusätze

- **!!! Absolut 100% Keimfrei !!!**
- Bei 120°C im Kessel Wasserdampf gekocht
  -> Wettbewerbsvorteil

- **Ganzjährig** Ernte unabhängig verfügbar

DEUTSCHE EINSTREU – product characteristics

Regulation of moisture – in general

- very high absorbency- **500% moisture suction !!!**
- **= very high ammonia binding** leads to healthy breasts, legs and plumage
- **Quick drying** helps to keep floors, walls and ceilings of **Stable dry and clean**

Naturally dry – stable comfort.

DEUTSCHE EINSTREU

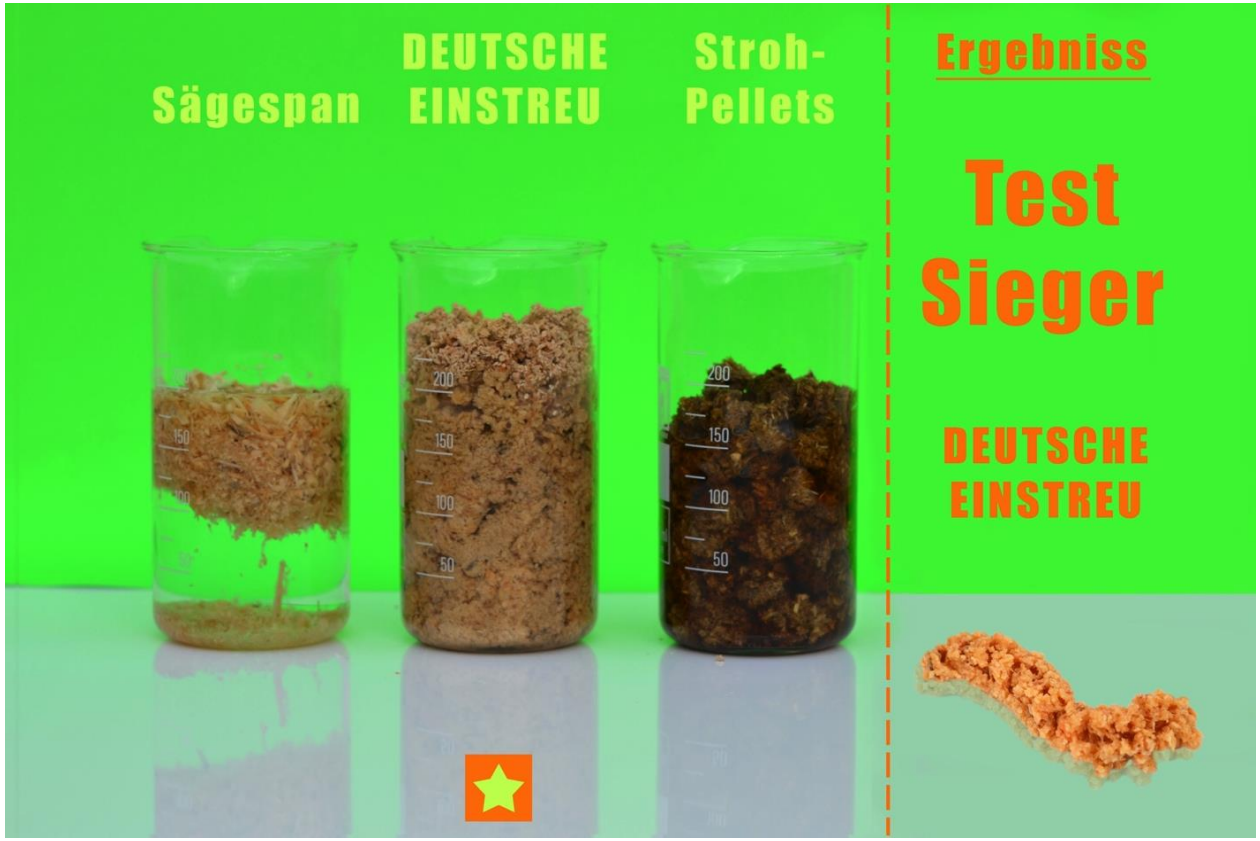
DEUTSCHE EINSTREU – product characteristics

Regulation of moisture – analysis in laboratory

- Study of moisture suction:

  ratio 1:2
  50g solid mass
  100g water

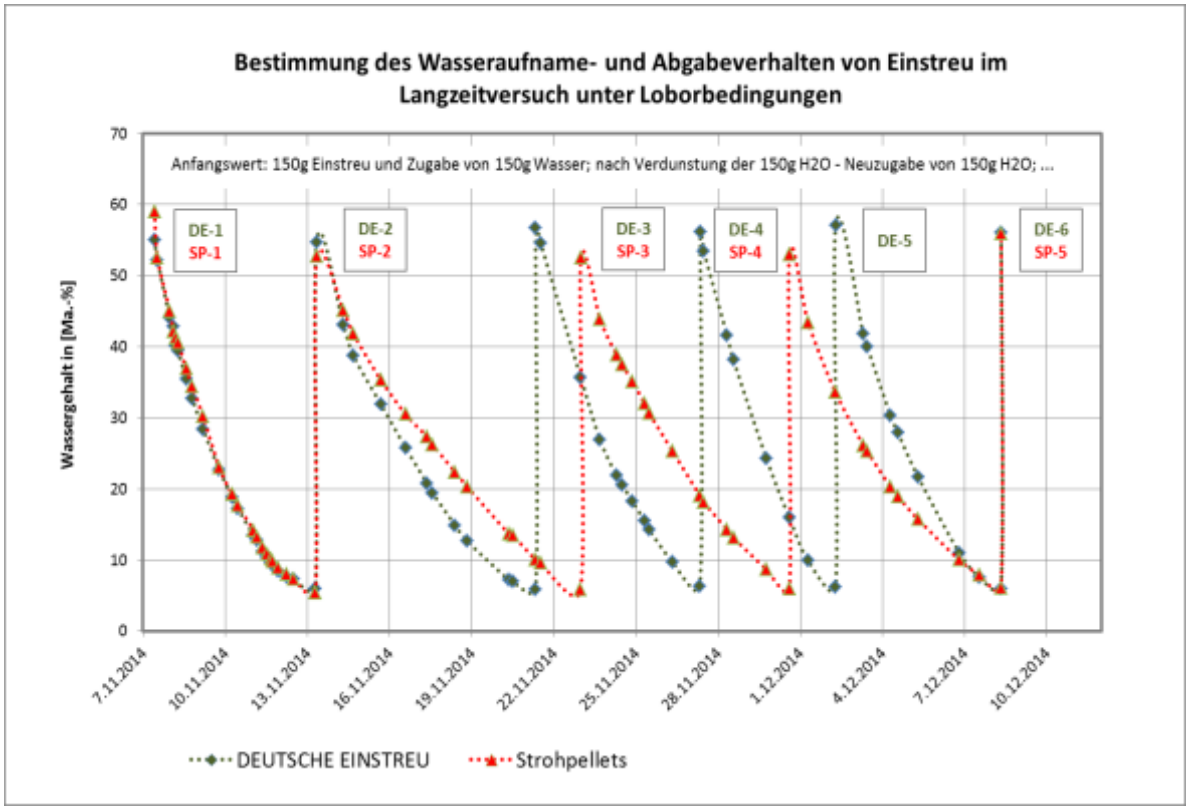
- DEUTSCHE EINSTREU displays highest moisture suction as well as quickness in absorbing compared to wood shavings and straw pellets



DEUTSCHE EINSTREU – product characteristics

Regulation of moisture – analysis in laboratory

- Study of indoor climate looking at several litter products
- DEUTSCHE EINSTREU transpires quicklier than straw pellets
- Drying with vapour at 120°C leads to decrease of capillaries so that DE reaches its initial value of w = 5- 6 Ma.-% in every cycle



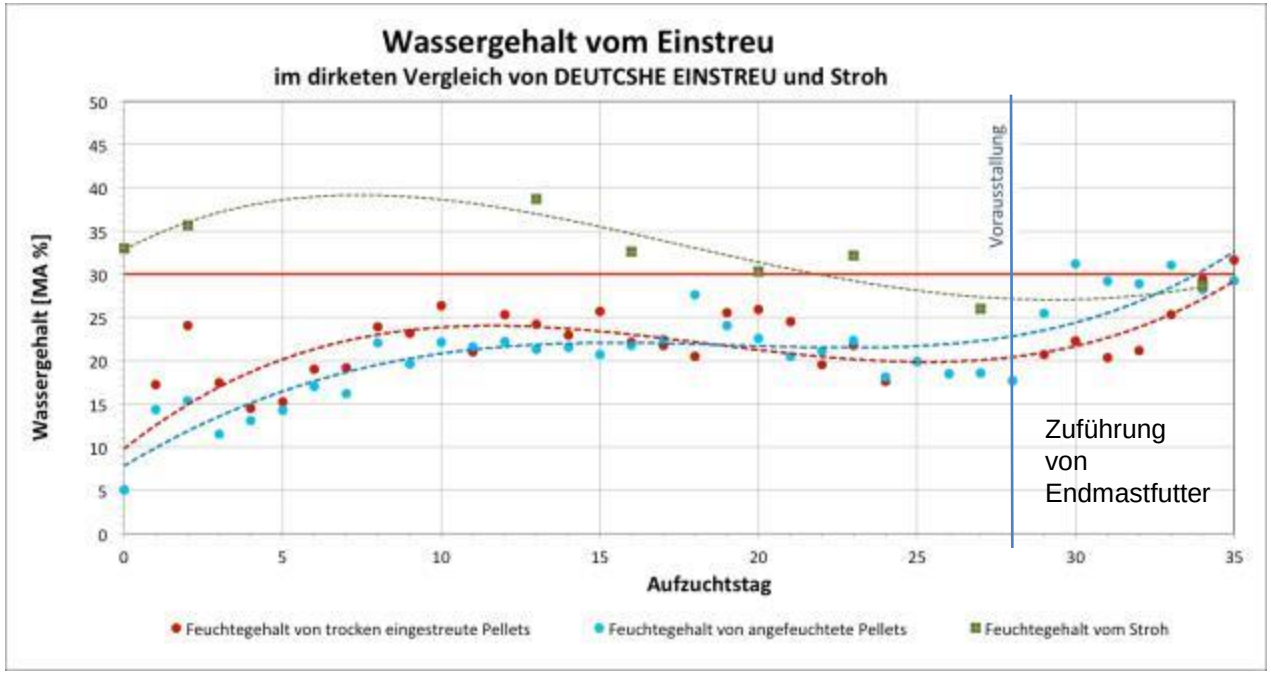
Naturally dry – stable comfort.

DEUTSCHE EINSTREU

DEUTSCHE EINSTREU – improves the climate in the stable

Regulation of moisture - practice

- Recommended level of moisture in litter for keeping healthy animals is at 30 Ma.-%
- DEUTSCHE EINSTREU is below this level and exhibits moisture regulating properties for the whole time of fattening



Naturally dry – stable comfort.

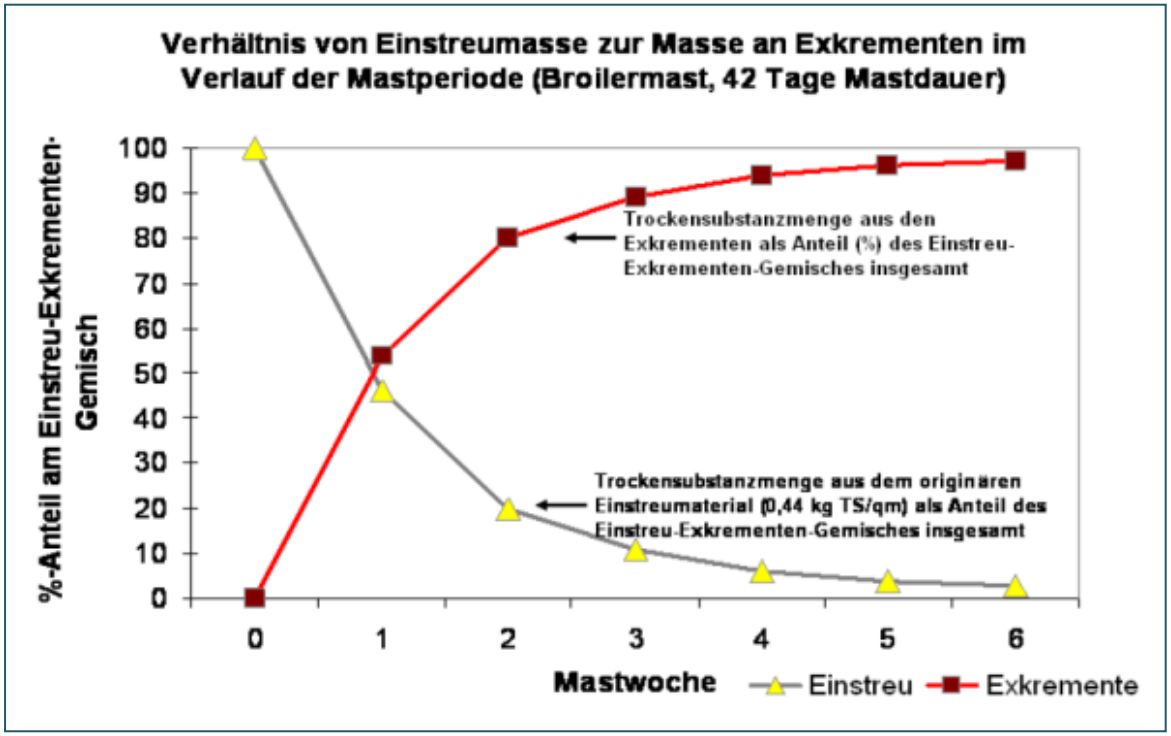
DEUTSCHE EINSTREU

DEUTSCHE EINSTREU – improves the climate in the stable

Regulation of moisture - practice

- The longer the fattening the higher the amount of faeces and germs (according to Prof. Kamphues 80% of solid content of the stable area starting with 2nd week of fattening).

- having a **tecnically produced 100% sterile litter with highest ability to regulate moisture** is essential for dry floors and healthy animals



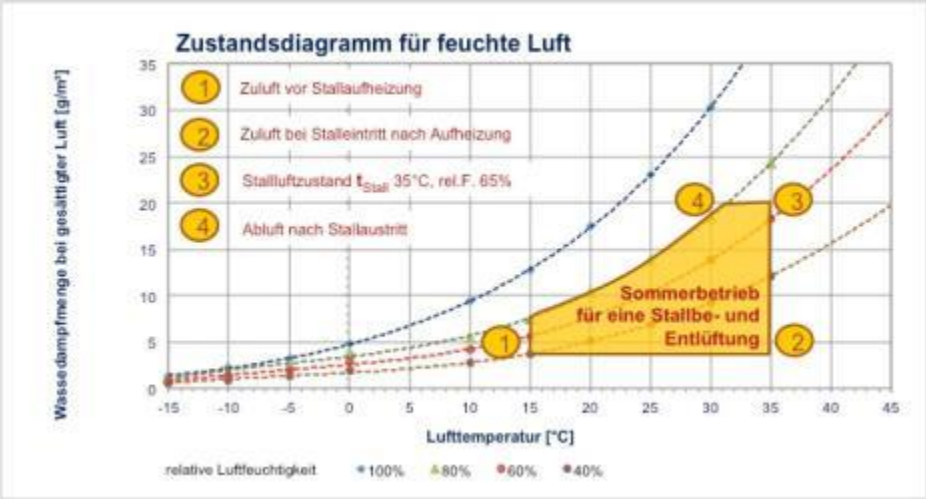
http://www.wing-vechta.de/themen/fussballengesundheit/zur_bedeutung_von_f_tterung_und_haltung_f_r_die_fu_ballengesundheit_beim_mastgefl_gel.html

Naturally dry – stable comfort.

DEUTSCHE EINSTREU

DEUTSCHE EINSTREU – improves the climate in the stable

- Healthy and productive animals can be raised with 100% sterile litter, which regulates the indoor climate of the stable throughout the year



Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 2

- Conventional straw (day 2)

- DEUTSCHE EINSTREU (day 3)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 6

- Conventional straw (day 6)

- DEUTSCHE EINSTREU (day 7)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 9

- Conventional straw (day 9)

- DEUTSCHE EINSTREU (day 10)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 13

- Conventional straw (day 13)

- DEUTSCHE EINSTREU (day 14)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 16

- Conventional straw (day 16)

- DEUTSCHE EINSTREU (day 17)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

Day 16

- Conventional straw (day 16)

- DEUTSCHE EINSTREU (day 17)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 20

- Conventional straw (day 20)

- DEUTSCHE EINSTREU (day 21)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 23

- Conventional straw (day 23)

- DEUTSCHE EINSTREU (day 21)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 27

- Conventional straw (day 27)

- DEUTSCHE EINSTREU (day 28)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 30

- Conventional straw (day 30)

- DEUTSCHE EINSTREU (day 28)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

DAY 36

- Conventional straw (day 33)

- DEUTSCHE EINSTREU (day 36)

Comparison – Straw vs. DEUTSCHE EINSTREU with chickens

Field trial 10/2014 – about 16K animals per stable, 230K animals overall

Day 36 – moving out

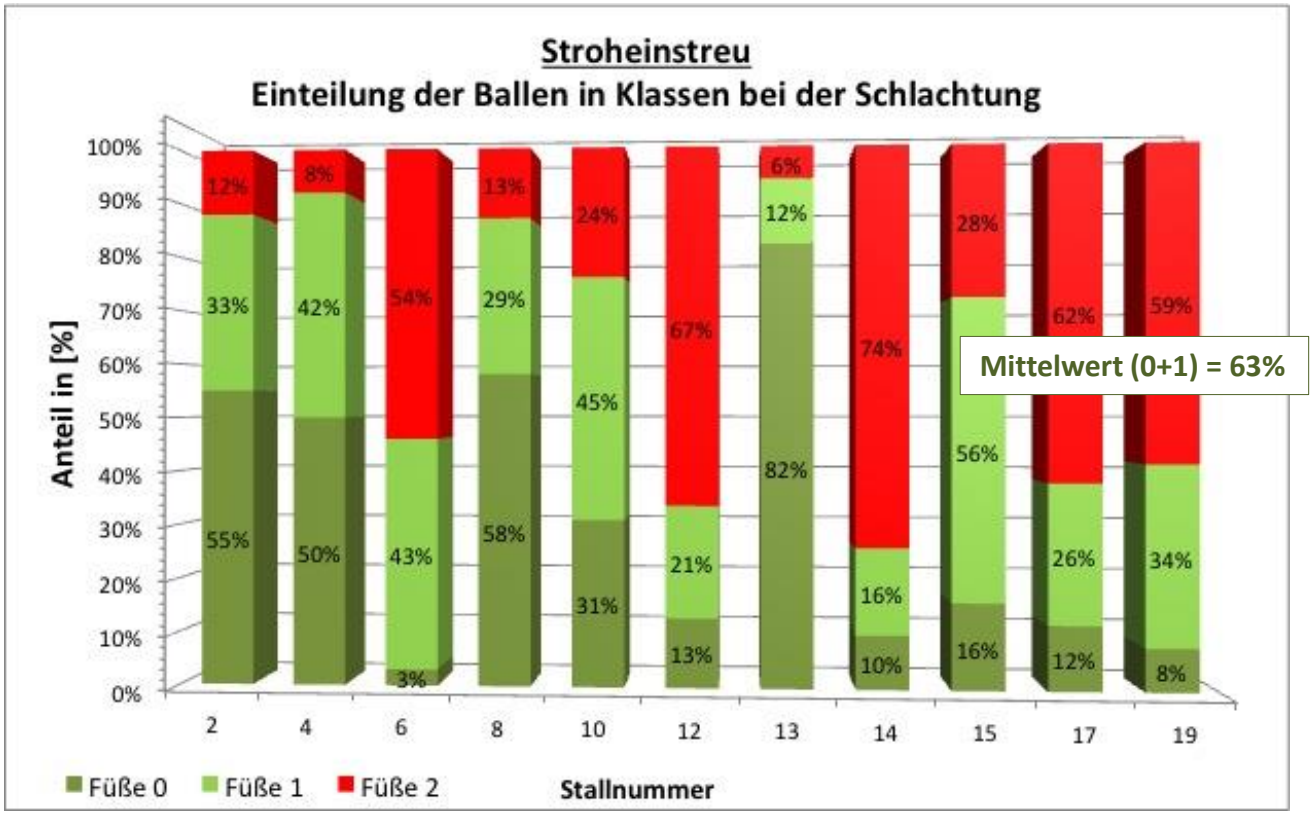
- Conventional straw (day 33)

- DEUTSCHE EINSTREU (day 36)

DEUTSCHE EINSTREU – results of field trial 10/2014 chicken

Examination of foot of about 230K chickens

- Examination shows that straw litter causes more ailments of feet
- The average of foot 0 + 1 is about **63%** and should be improved



Influenced by -> parents, structure, climate, type of litter, water content of faeces, management of food, i.a.

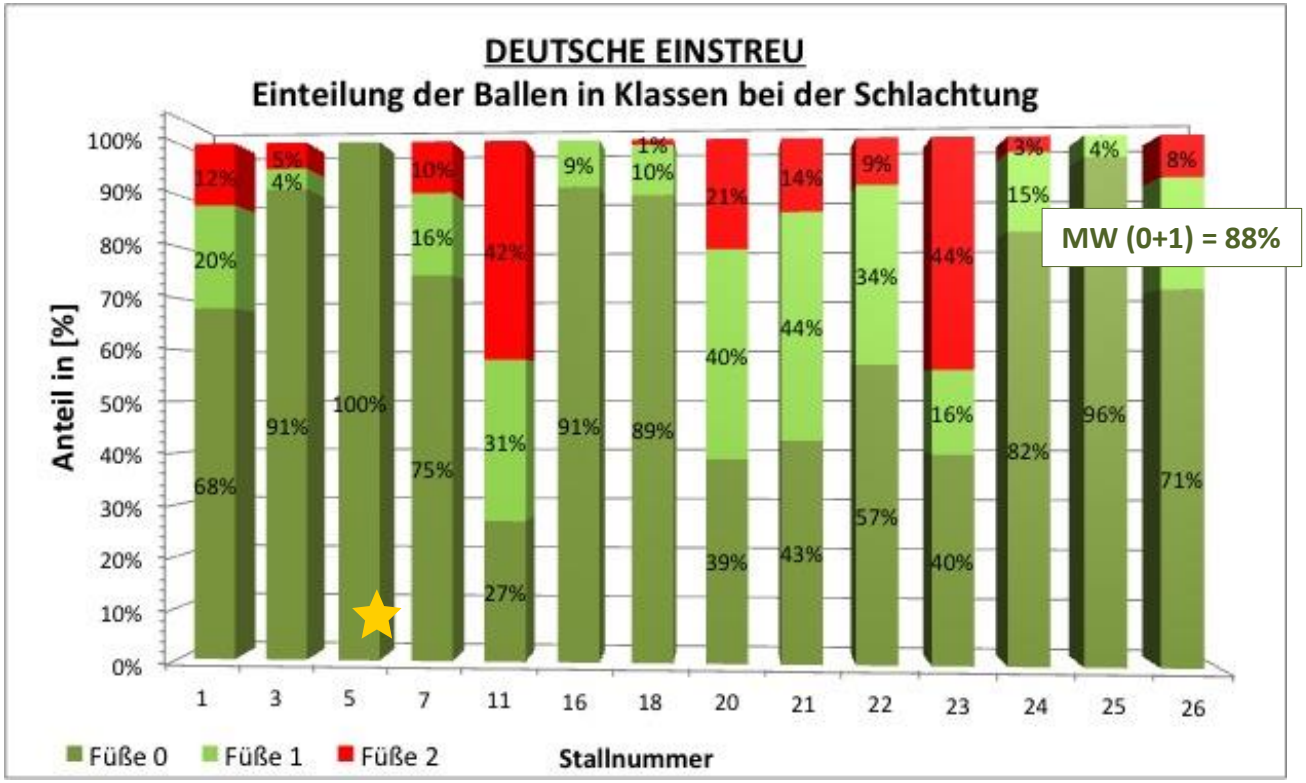
Naturally dry – stable comfort.

DEUTSCHE EINSTREU

DEUTSCHE EINSTREU – results of field trial 10/2014 chicken

Examination of foot of about 230K chickens

- Examining DEUTSCHE EINSTREU shows positive, trend-setting results
- Average of foot 0 + 1 is about **88%** within the area of health



★ best results concerning the health of feet as well as slaughter weight

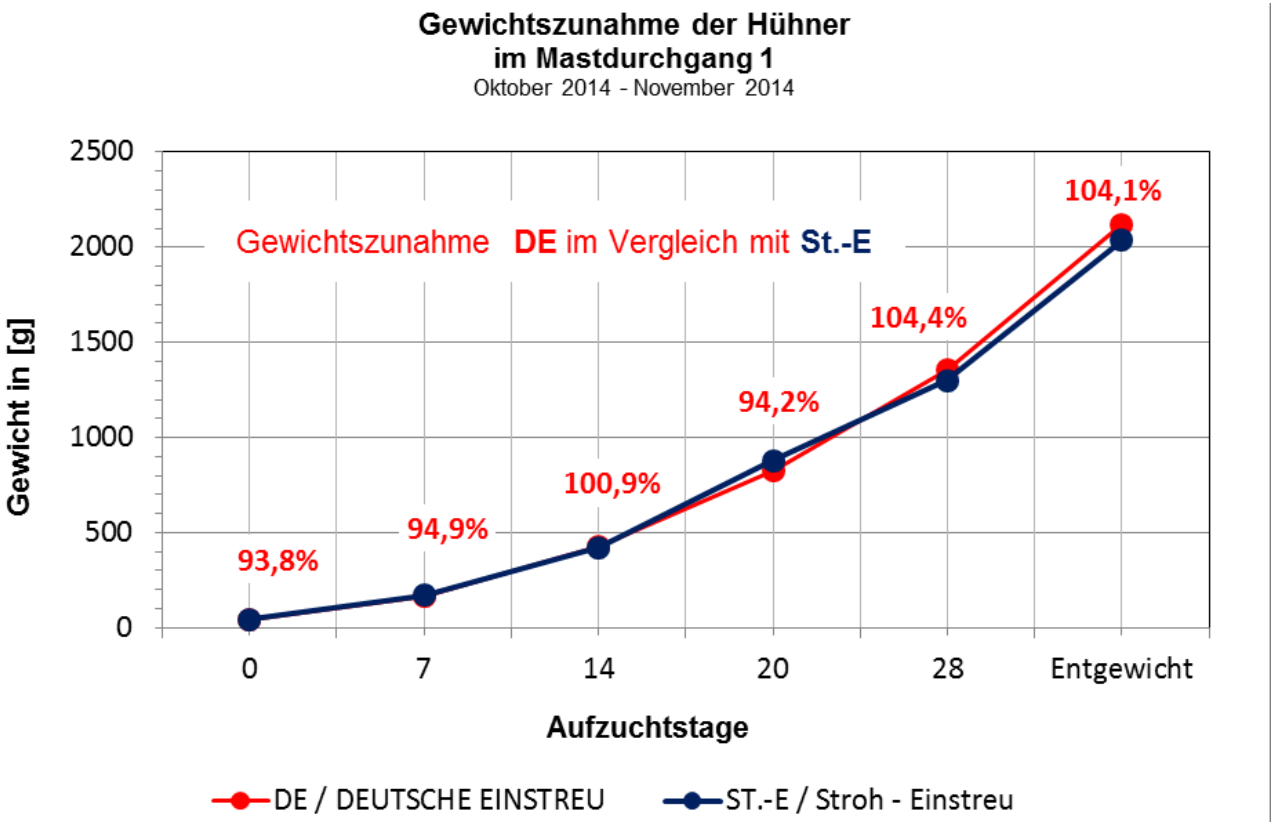
Influenced by -> parents, structure, climate, **type of litter**, water content of faeces, management of food, i.a.

DEUTSCHE EINSTREU

DEUTSCHE EINSTREU – results of field trial 10/2014 chicken

Examination of weight of about 230K chickens

- Results for DEUTSCHE EINSTREU show a significant gain of weight of about 4-5% until the end of fattening
- There were no extra administrations of concentrate feed and dose of commmon drugs was reduced



DEUTSCHE EINSTREU – results of field trial 10/2014 chicken

Conclusion

- Health of feet at day of slaughter **DE = 88%**
- **DE 4% = 80g** extra gain of weight (based on 2 kg slaughter weight of a chicken)
- Moisture content of DE **until day 28 below 30 Ma.-%** leads to reduction of drug administration **DE = 22% reduction of additional drugs** resp. reduction of antibiotic administration **DE = 46% reduction of antibiotics**
- Examining the indoor climate of the stable in comparison with environment data (outdoor temperature and humidity) shows, that **it is possible to absorb moisture in the stall continuouisly until day**
- Actions taken from day 28 to avoid drenching of DE litter bedding due to structural conditions:
  a) additional interspersal of DE **b)** rising of temperature in stable
  c) combination of a) and b)

Comparison – Straw vs. DEUTSCHE EINSTREU with turkey

Field trial 10/2014 – about 3000K animals overall

DAY 2

- DEUTSCHE EINSTREU

Comparison – Straw vs. DEUTSCHE EINSTREU with turkey

Field trial 10/2014 – about 3000K animals overall

Day 12

- Conventional straw

- DEUTSCHE EINSTREU

Comparison – Straw vs. DEUTSCHE EINSTREU with turkey

Field trial 10/2014 – about 3000K animals overall

DAY 53

- DEUTSCHE EINSTREU

Comparison – Straw vs. DEUTSCHE EINSTREU with turkey

Field trial 10/2014 – about 3000K animals overall

DAY 145 – Moving out

- DEUTSCHE EINSTREU

DEUTSCHE EINSTREU

DEUTSCHE EINSTREU – results of field trial 10/2014 turkey

summary

- Complete waiver of antibiotics **DE = 100 % decrease of antibiotics**
- In 50 years of turkey fattening best results after slaughter with DE
- Healthy white turkeys up until end of fattening
- Very healthy feet up until end of fattening
- Average final weight at slaughter: 23.93 kg –
  DE = gain of weight per turkey 1.63 kg without additional concentrate feed
- Actions taken from day 28 to avoid drenching of DE litter bedding due to structural conditions:
  a) additional interspersal of DE **b)** rising of temperature in stable
  c) combination of a) and b)

DEUTSCHE EINSTREU

DEUTSCHE EINSTREU chicken, turkey & co - CONCLUSION

- **hygienic support in the stable** decreases infections, helps to **boost immune system in the first days**

- Leads to **healthy feet** and is **anti-inflammatory**

  *DEUTSCHE EINSTREU is **100% free of contaminants and pests,** extremely absorbant and dry during the whole fattening process and thus helps to **fight pathogens like salmonellae***

- **First interspersal app. 750g per m^2** - additional interspersal as needed

DEUTSCHE EINSTREU

DEUTSCHE EINSTREU chicken, turkey & co - CONCLUSION

- **Almost dust free litter**– clearing out easier and quicker

- **More effective than straw (overall view)**
  less storage space needed for DE
  independent from environmental influences (no contaminants or pests) and harvest time
  decrease of oncosts from pests (loss of animals, damage of stable)
  less amount of work (overall) and operating costs (e.g. heating)

- **Support of scratching and easy on balls and toes** due to soft litter matress

DEUTSCHE EINSTREU

DEUTSCHE EINSTREU chicken, turkey & co - CONCLUSION

Summary of test results in 2014

- ✓ Unique production process of DE garantees **100% sterility** of **DEUTSCHE EINSTREU.**
- ✓ DE is produced without any additives
- ✓ H_5N_8 – viri a.o. are killed during sterilizing of DE at 120 °C in pure aqueous vapor for 30 minutes
- ✓ DE has a low germ load during the whole fattening process
- ✓ DE has a high absorbancy of **500 Ma.-%**, thus DE can effectively regulate humidity in the stable.
- ✓ Moisture content of DE is at 25 % in used litter. It creates a soft bedding and shows no agglutination.

DEUTSCHE EINSTREU

Das Fazit - DEUTSCHE EINSTREU chicken & co.

Summary of test results in 2014

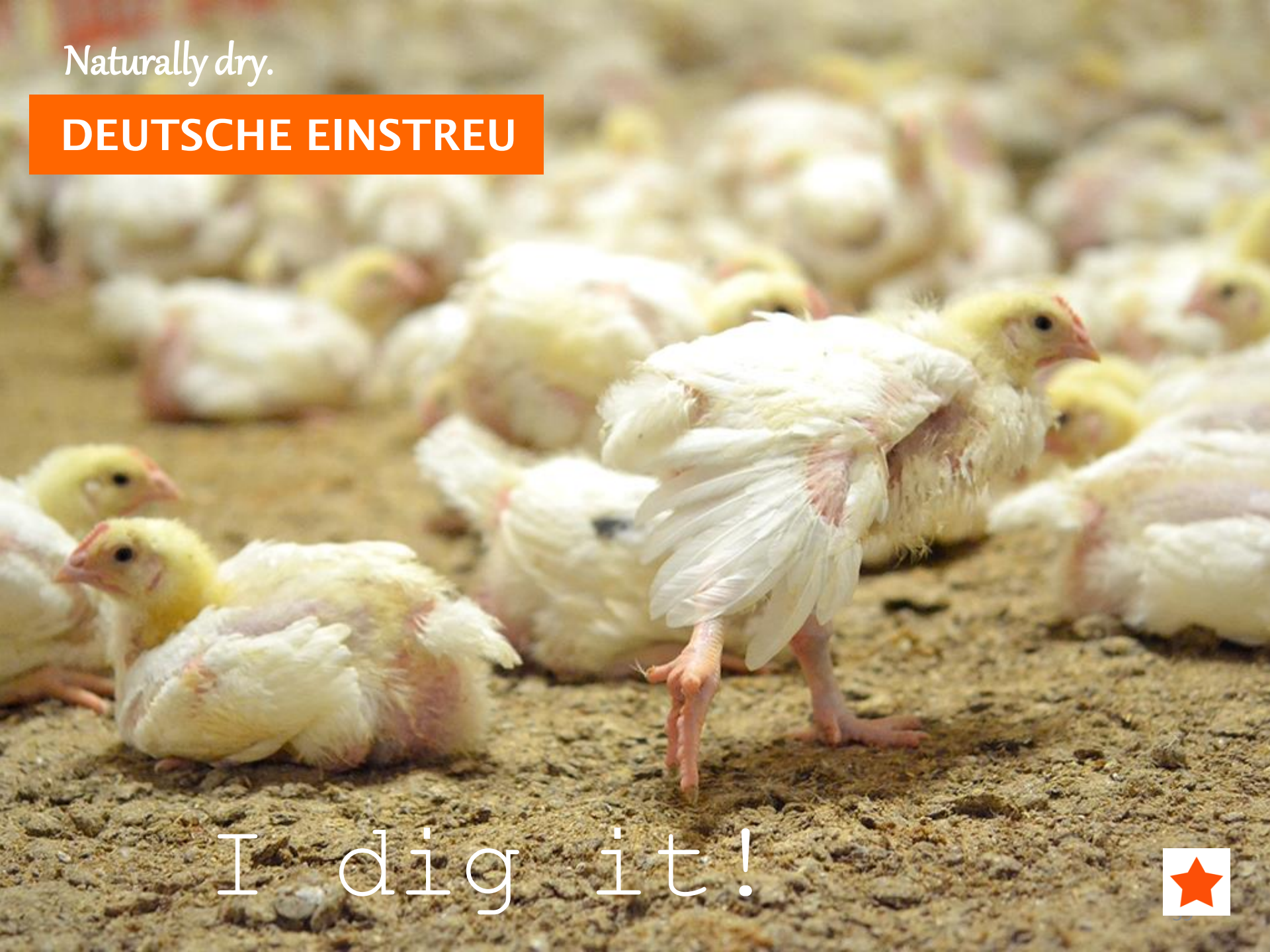
- ✓ With use of DE there are healthier balls and breasts
- ✓ Since ammonium is bound there is less odour nuissance during the whole fattening
- ✓ pH of DE is close to pH of surface of claws, it is easy on the skin.
- ✓ **Essential oils in DE are antibacterial, anti-inflammatory and help to heal wounds.**
- ✓ With the use of DE there were less drugs (Penicillin) needed in the tested flocks
- ✓ **The use of DE leads to less costs from the first day in the stable until the end of fattening, DE has about 75% of costs compared to straw.**

Naturally dry – stable comfort.

DEUTSCHE EINSTREU

The product - DEUTSCHE EINSTREU chicken, turkey & co

- Is available **in 15kg, 500kg / 800kg and as dry bulk**


Naturally dry.
DEUTSCHE EINSTREU
I dig it!

DEUTSCHE EINSTREU

From litter to manure

- Turkey is kept on DEUTSCHE EINSTREU during the fattening
- After moving out the used litter is given to a bio gas plant
- By producing bio gas from the used litter, the germ content can be lowered
- After production of biogas the used litter can be put on the field as manure
- By inactivation of methane bacteria the production of methane in the field can be stopped, thus avoiding green house effect

Naturally dry – stable comfort.

DEUTSCHE EINSTREU

Analysis of dried turkey litter from DEUTSCHE EINSTREU

Prüfbericht: PB-130516-006

Probenbezeichnung:	Putenmist 1	Eingangsdatum:	13.05.2016
Probenentnahme:	10.05.2016	Prüfungsbeginn:	13.05.2016
Abgefüllt von:	Auftraggeber	Prüfungsende:	19.05.2016
Probenmenge:	500 g	Labornummer:	130516-006
Paket:	Weender Analyse	Prüfgegenstand:	Wirtschaftsdünger
Probenherkunft:	Biogas Golzow GmbH & Co. KG		

Parameter	Methode	Einheit	Ergebnisse
Trockensubstanz (TS)	DIN EN 12880	%	60,7
organische Trockensubstanz (oTS)	DIN EN 12879	%	47,4
Glühverlust	DIN EN 12879	%	78
Wasser (H2O)	DIN EN 12880	%	39
Fett i.d.OS	VDLUFA Bd. III, Kap. 5.1.1*	% OS	0,86
Fett i.d.TS	VDLUFA Bd. III, Kap. 5.1.1*	% TS	1,42
Rohfaser i.d.OS	VDLUFA Bd. III, Kap.6.1.1*	% OS	22,6
Rohfaser i.d.TS	VDLUFA Bd. III, Kap.6.1.1*	% TS	37,2
Protein (N x 6,25) i.d.OS	VDLUFA Bd. III, Kap. 4.1.1	% OS	11,30
Protein (N x 6,25) i.d.TS	VDLUFA Bd. III, Kap. 4.1.1*	% TS	18,6
theoretischer Gasertrag (i.d.OS)	Berechnung nach Baserga*	l/ kg i.d.OS	212
theoretischer Gasertrag (i.d.oTS)	Berechnung nach Baserga*	l/ kg i.d.oTS	447
Methan (CH4)	Berechnung nach Baserga*	%	55

n.n. = nicht nachweisbar, FOS = flüchtige organische Säuren, TS = Trockensubstanz, OS = Original Substanz, * = nicht akkreditierte Methode, WAT-012011-09 = Hausmethode Gaschromatograph, # = Untersuchung erfolgte von Fremdlabor

Naturally dry – stable comfort.

DEUTSCHE EINSTREU

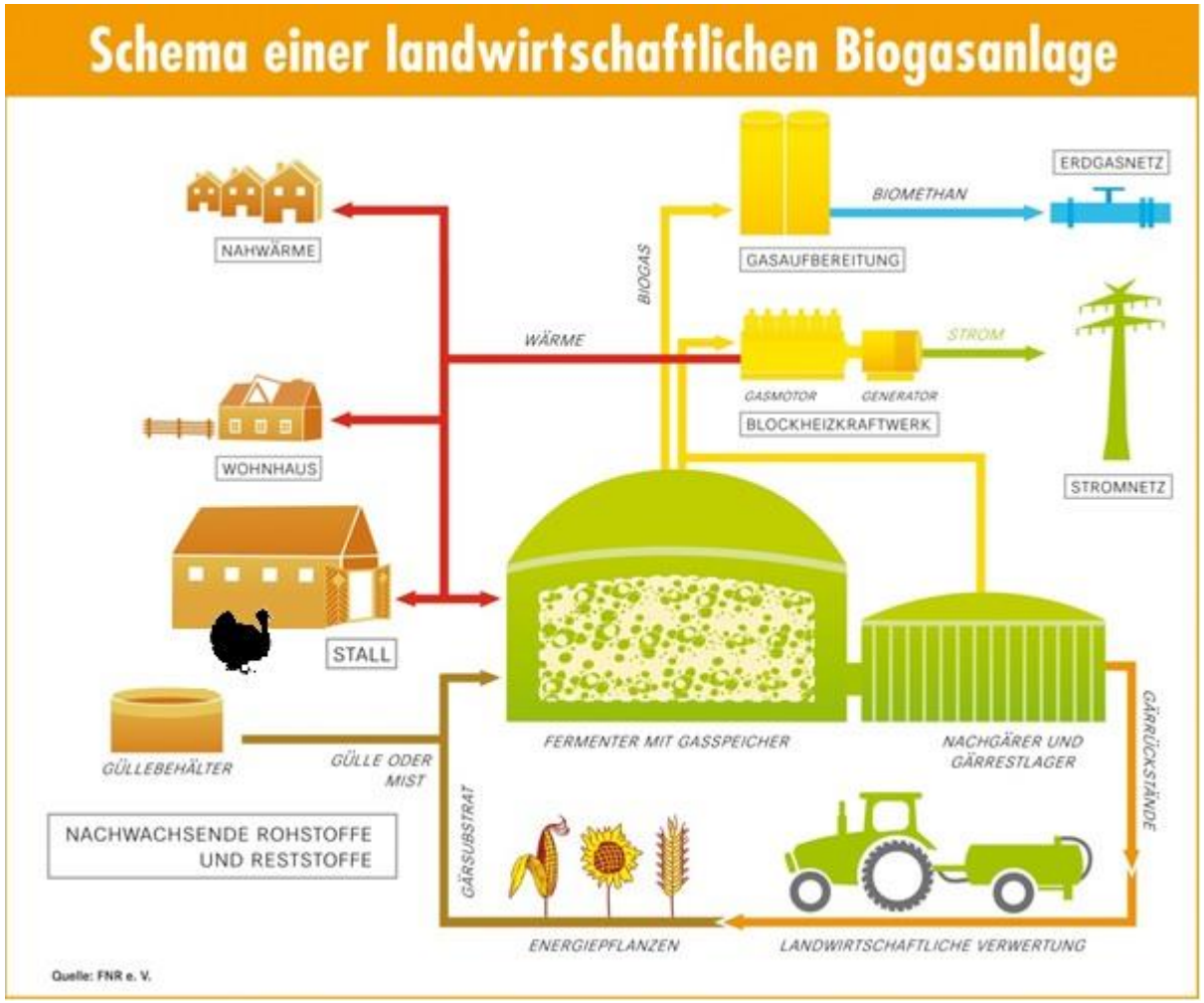
Analysis of dried turkey litter from DEUTSCHE EINSTREU

Prüfbericht: PB-130516-009

Probenbezeichnung:	Putenmist 2	Eingangsdatum:	13.05.2016
Probenentnahme:	10.05.2016	Prüfungsbeginn:	13.05.2016
Abgefüllt von:	Auftraggeber	Prüfungsende:	19.05.2016
Probenmenge:	500 g	Labornummer:	130516-009
Paket:	Weender Analyse	Prüfgegenstand:	Wirtschaftsdünger
Probenherkunft:	Biogas Golzow GmbH & Co. KG		

Parameter	Methode	Einheit	Ergebnisse
Trockensubstanz (TS)	DIN EN 12880	%	61,3
organische Trockensubstanz (oTS)	DIN EN 12879	%	47,7
Glühverlust	DIN EN 12879	%	78
Wasser (H2O)	DIN EN 12880	%	39
Fett i.d.OS	VDLUFA Bd. III, Kap. 5.1.1*	% OS	1,00
Fett i.d.TS	VDLUFA Bd. III, Kap. 5.1.1*	% TS	1,62
Rohfaser i.d.OS	VDLUFA Bd. III, Kap.6.1.1*	% OS	22,2
Rohfaser i.d.TS	VDLUFA Bd. III, Kap.6.1.1*	% TS	36,2
Protein (N x 6,25) i.d.OS	VDLUFA Bd. III, Kap. 4.1.1	% OS	11,90
Protein (N x 6,25) i.d.TS	VDLUFA Bd. III, Kap. 4.1.1*	% TS	19,4
theoretischer Gasertrag (i.d.OS)	Berechnung nach Baserga*	l/ kg i.d.OS	210
theoretischer Gasertrag (i.d.oTS)	Berechnung nach Baserga*	l/ kg i.d.oTS	447
Methan (CH4)	Berechnung nach Baserga*	%	55

n.n. = nicht nachweisbar, FOS = flüchtige organische Säuren, TS = Trockensubstanz, OS = Original Substanz, * = nicht akkreditierte Methode, WAT-012011-09 = Hausmethode Gaschromatograph, # = Untersuchung erfolgte von Fremdlabor



Quelle: Fachagentur Nachwachsende Rohstoffe e.V. (FNR)".
https://mediathek.fnr.de/grafiken/daten-und-fakten/bioenergie/biogas/schema-einer-landwirtschaftlichen-biogasanlage.html

Comparison of various substrates for bio gas production

Vergleich von Biogasrohstoffen

Material	Biogasertrag[1] in m³ pro Tonne Frischmasse	Methangehalt
Maissilage	202	52 %
Grassilage	172	54 %
Roggen-GPS	163	52 %
Futterrübe	111	51 %
Bioabfall	100	61 %
Hühnermist	80	60%
Zuckerrübenschnitzel	67	72 %
Schweinemist	60	60 %
Rindermist	45	60 %
Getreideschlempe	40	61 %
Schweinegülle	28	65 %
Rindergülle	25	60 %

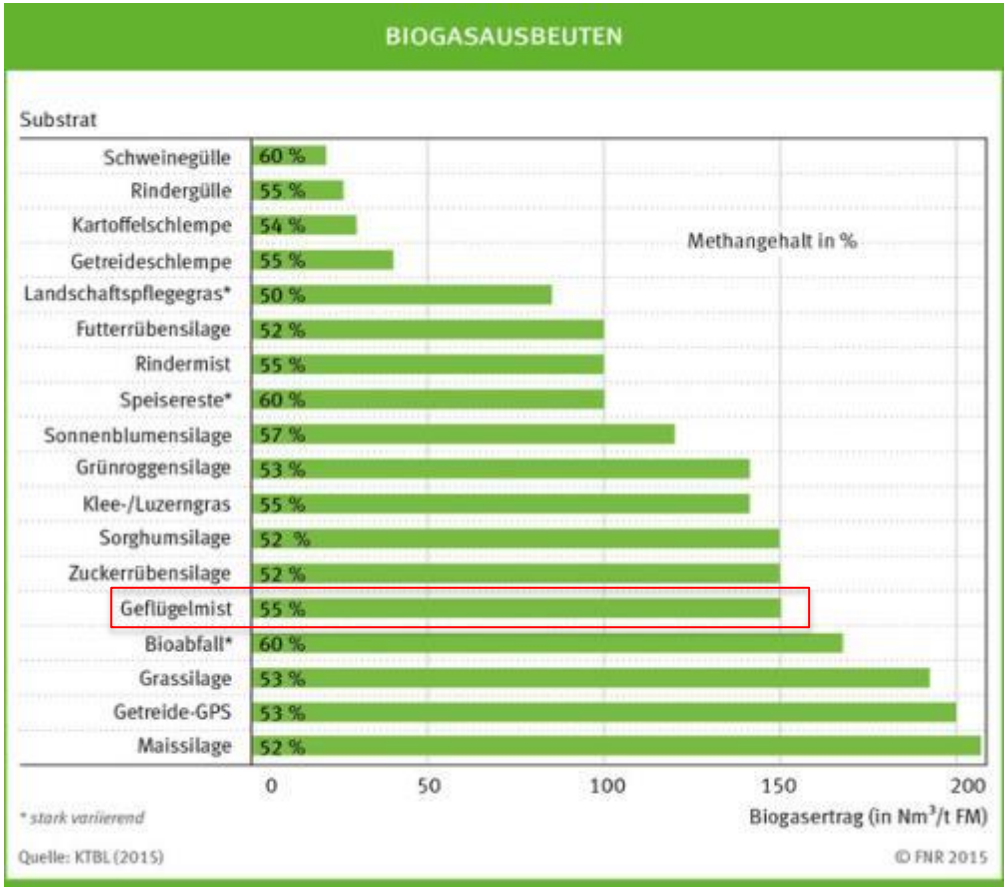
Dried turkey litter from DEUTSCHE EINSTREU

Content of methane: 55%

Yield of biogas: 210-212 m³/t

Quelle: Fachagentur Nachwachsende Rohstoffe e. V. (FNR): *Biogas Basisdaten Deutschland Stand: Januar 2008.*

Comparison of various substrates for bio gas production



Quelle: "Fachagentur Nachwachsende Rohstoffe e.V. (FNR)".
https://mediathek.fnr.de/grafiken/daten-und-fakten/bioenergie/biogas/gasausbeuten-verschiedener-substrate-fm.html

Vergleich verschiedener Substrate für die Biogasproduktion

	Rindergülle	Schweinegülle	Hühnertrockenkot	Maissilage
TS in %	7 - 17	2,5 - 13	20 - 34	28-35
oTS %	44 - 86	52 - 84	70 - 80	24-36
pH	6,2 - 8	6,5 - 7,6	7 - 8	3,8-4,2
Rohfaser % / TS	12 - 24	17	12	17-20
Fette % / TS	2 - 5	9	2	< 20
Rohprotein % / TS	10 - 18	24	26	8-9
Gasausbeute l/kg oTS	176 - 520	220 - 637	327 - 722	300-1130
Biogasproduktion m³/ GVE /Tag	0,56 - 1,5	0,6 - 1,25	3,5 - 4,0	0,6

Quelle: BTS Biogas GmbH
Quelle Maissilage: http://www.schaumann.de/cps/schaumann-de/ds_doc/FIBEL_BONSILAGE_Mais_DE_rgb_110802.pdf

Nutrient values of dried turkey manure from DEUTSCHE EINSTREU

LKS-Landwirtschaftliche Kommunikations- und Service-GmbH 09577 Lichtenwalde, August-Bebel-Str. 6
- Boden- und Futtermittellabor - Telefon : 037206 / 87140, email : luw@lks-mbh.com

UNTERSUCHUNGSERGEBNIS **Futtermittel**

Debitor: 80535

VZR Verfahrenszentrum
Reichstädt GmbH
Reichstädt
Am Hofbusch 4
01744 Dippoldiswalde

Probenart:	Einstreu
Probe-Nr.:	151028-2
gezogen am:	keine Angaben
Lagerort:	keine Angaben
Probeneingang:	29.10.2015
Journal-Nr.:	201544479
Probenehmer:	keine Angaben
Prüfzeitraum:	29.10.2015 - 02.11.2015

Sensorischer Befund:

Analytischer Befund: im kg Originalsubstanz

Stickstoff gesamt	**g**	**18,4**
Kalium	**g**	**18,3**
Phosphor	**g**	**10,1**

A piece of home.