

COMMON INFLUENCE OF POULTRY FARMS AND FERTILIZER FACTORIES ON BUILDINGS

Waiting for others to join



Q&A

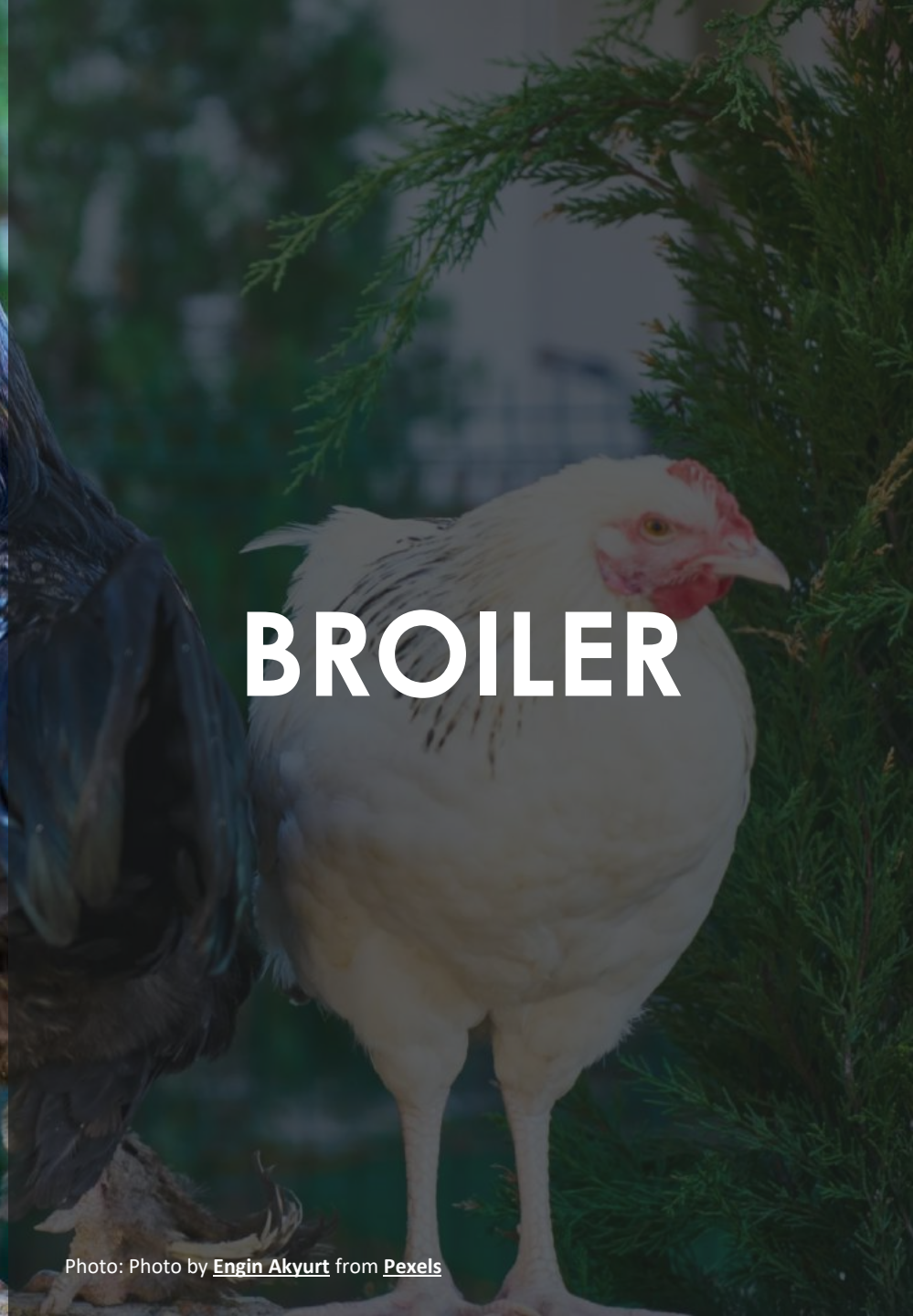
All (0)

Select a question and then type your answer here.
There's a 256-character limit.

Send Send Privately...

> Polling

COMMON INFLUENCE OF POULTRY FARMS AND FERTILIZER FACTORIES ON BUILDINGS



BROILER



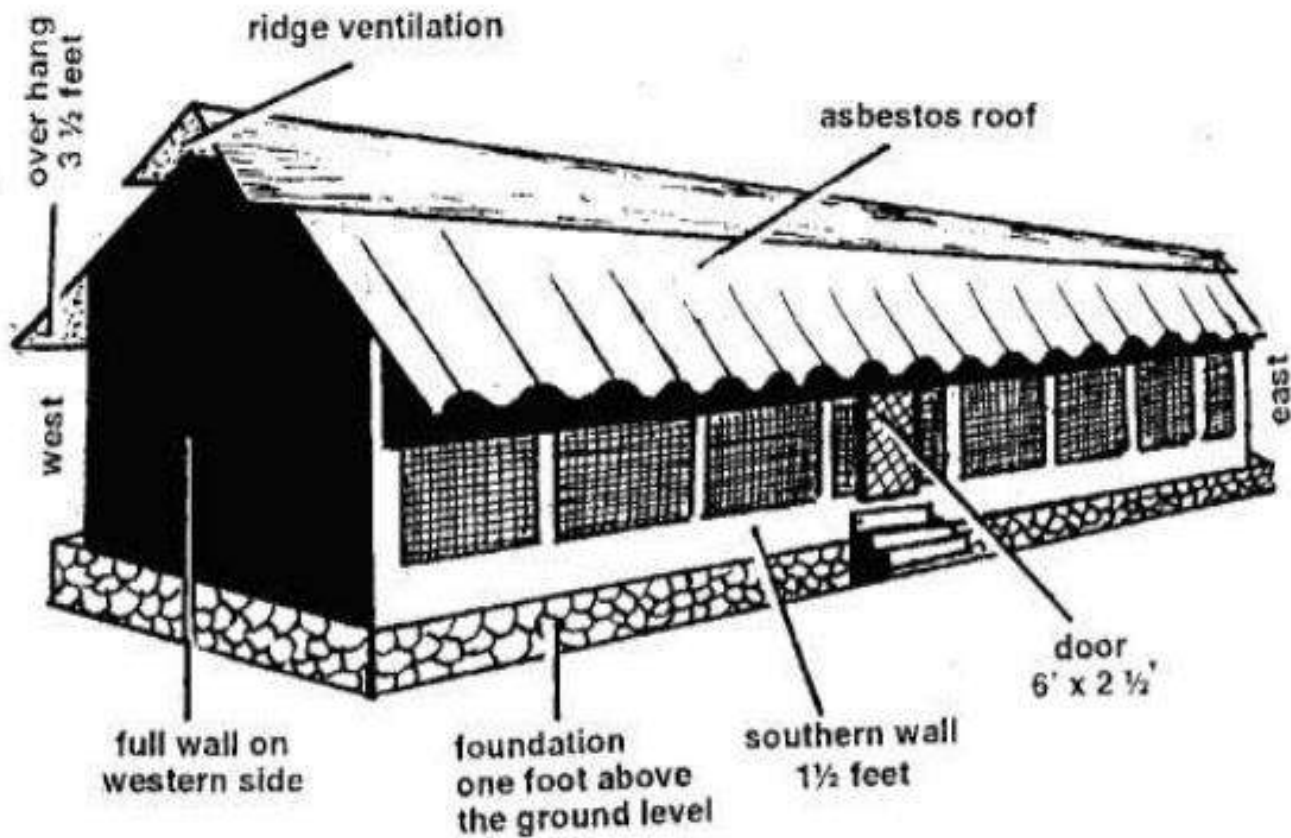
BROILER – CHICKEN RAISED FOR MEAT



POULTRY & FERTILIZER



**PERCEIVED TO
BE DIRTY AND
SMELLY**



A model poultry house

OLD POULTRY FARM DESIGN



EXAMPLE OF OLD POULTRY SHED



EXAMPLE OF OLD POULTRY SHED



EXAMPLE OF FERTILIZER FACTORY





EXAMPLE OF FERTILIZER FACTORY

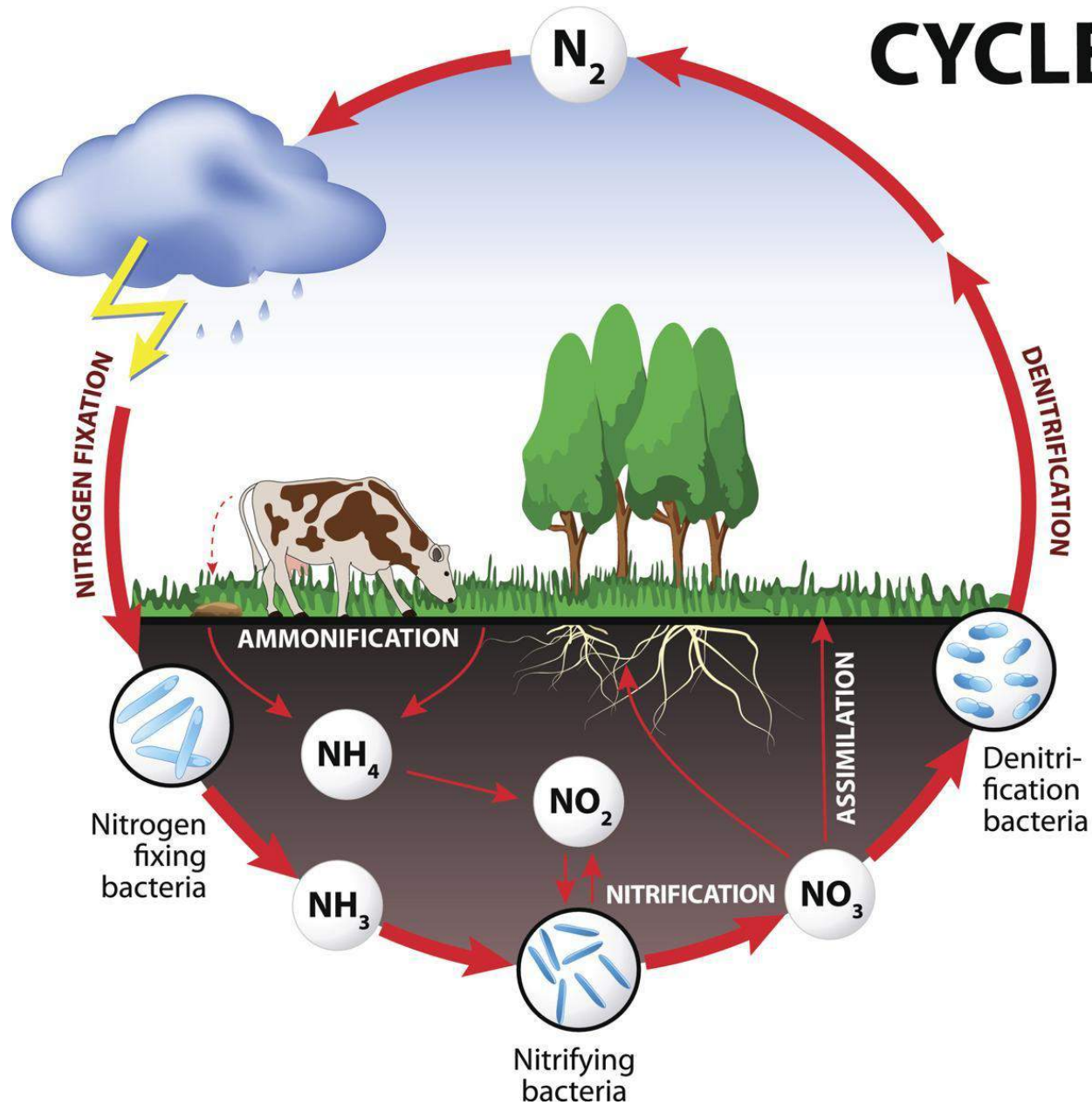


EXAMPLE OF FERTILIZER FACTORY

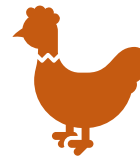
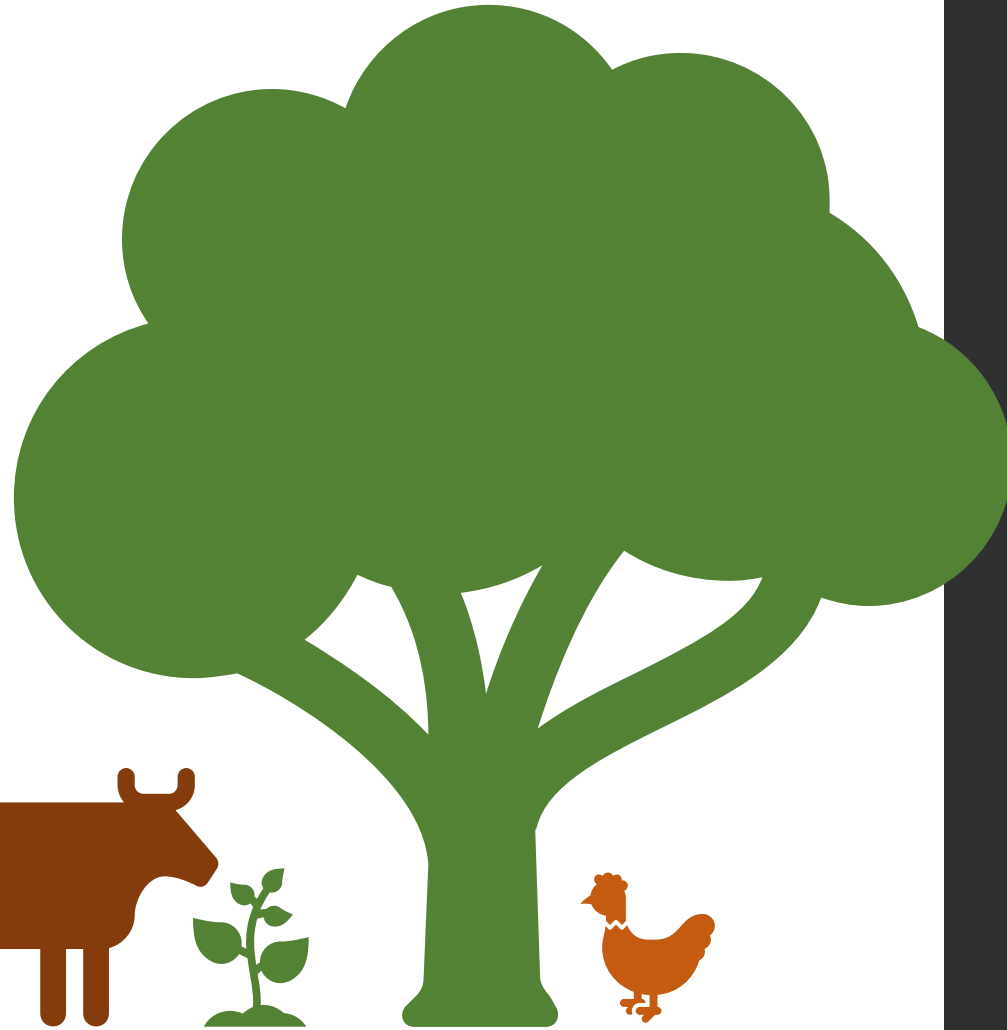
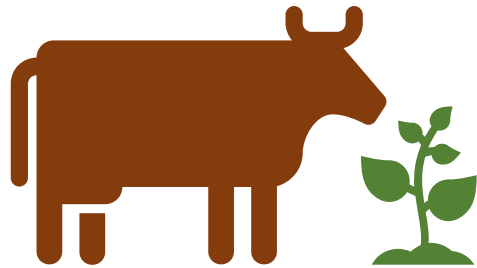
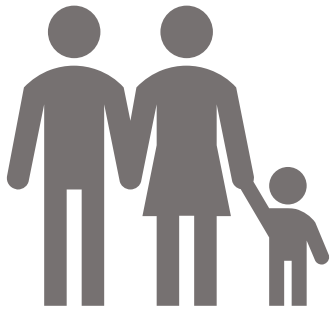


ESSENTIALLY FARMS & FERTILIZER FACTORY REQUIRES DIFFERENT DESIGNS

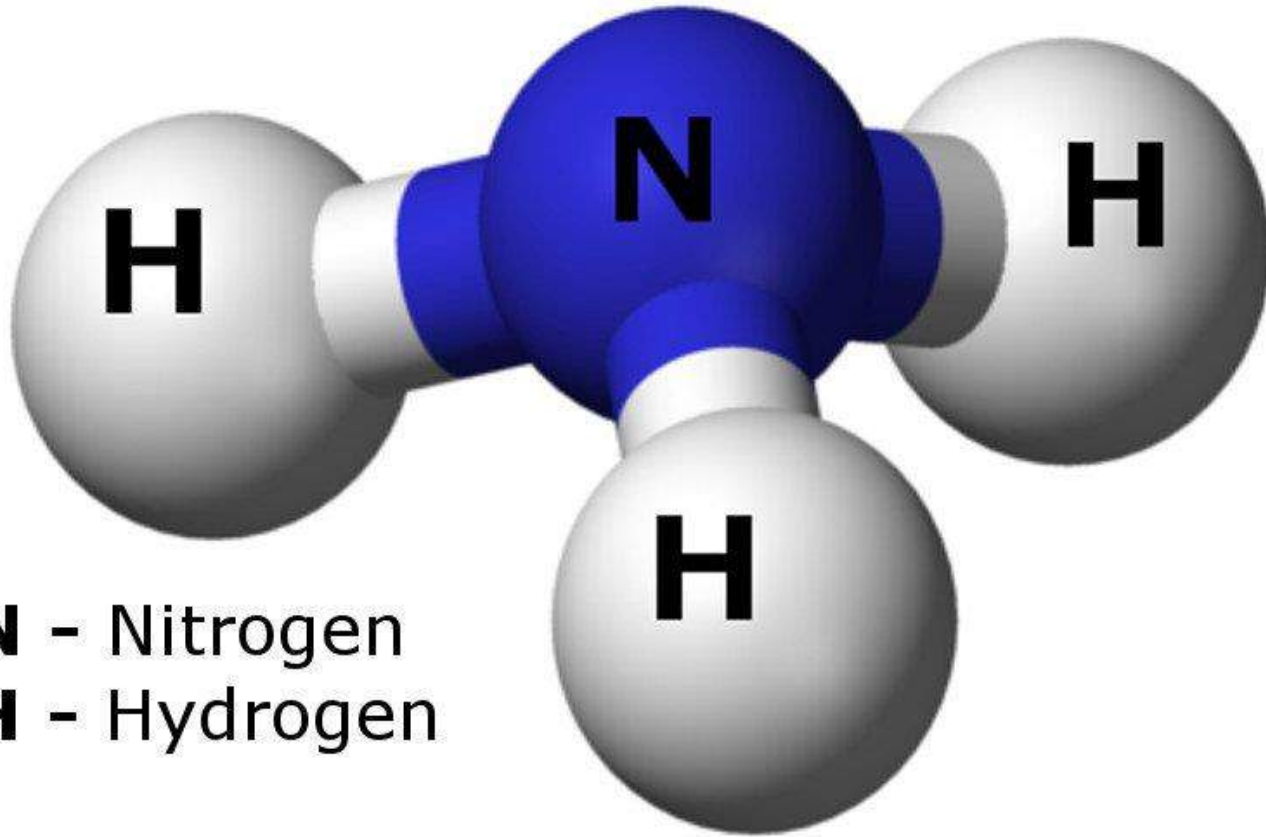
NITROGEN CYCLE



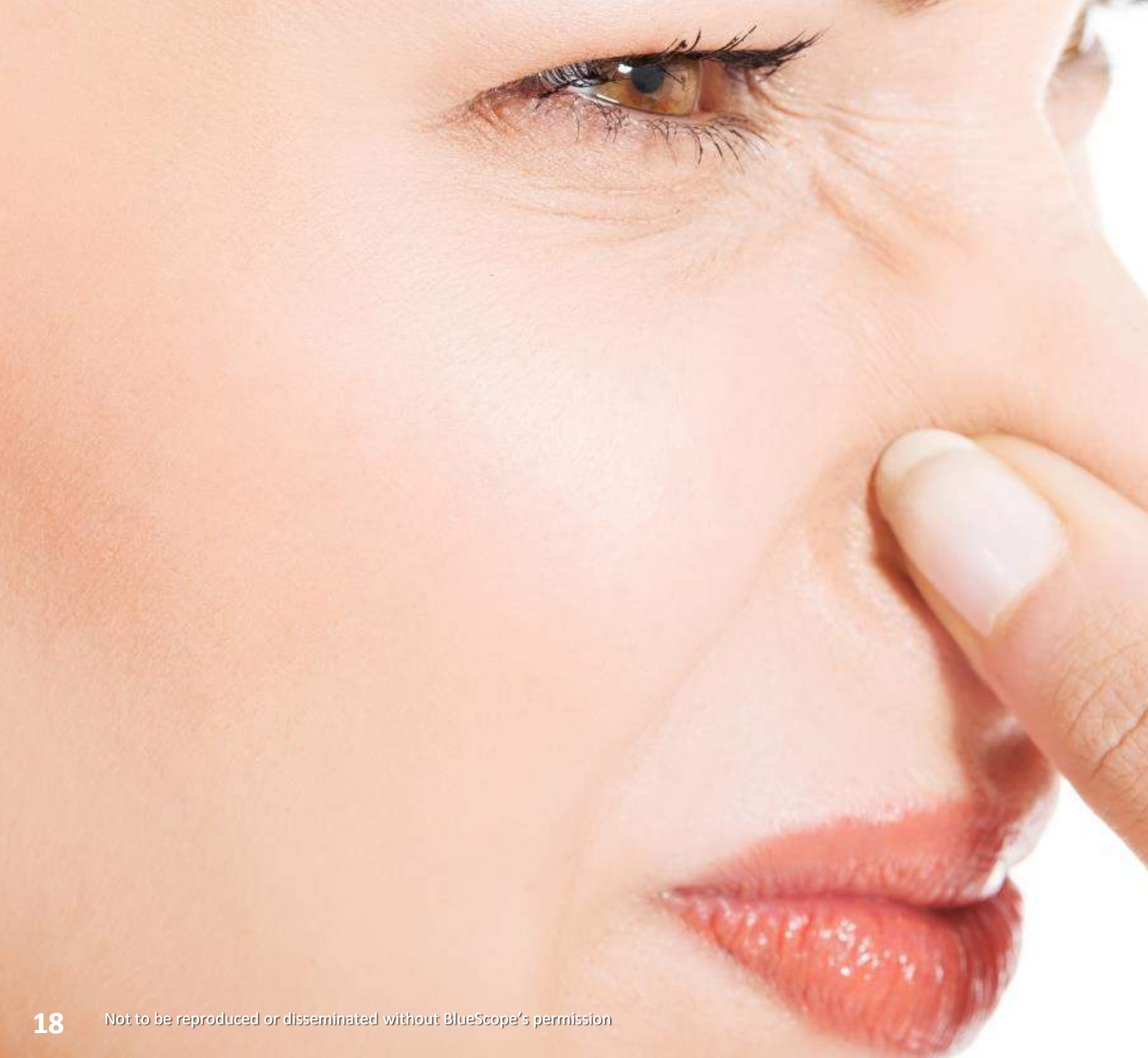
FALLS WITHIN
THE
NITROGEN
CYCLE



BASIC BUILDING BLOCK OF FLORA & FAUNA



**WHEN
NITROGEN IS
IN THE FORM
OF
AMMONIA**



**RELEASE
PUNGENT
SMELL**



A HYGROSCOPIC SUBSTANCE



**DISSOLVES
EASILY IN
WATER AND
FORM
AMMONIUM
HYDROXIDE
(ALKALINE)**

ANHYDROUS AMMONIA

UN 1005

Risk

- Corrosive Material – May be harmful to eyes & skin
 - May be fatal if inhaled or ingested
- Compressed Gas – Contents under pressure



Precautionary Measures

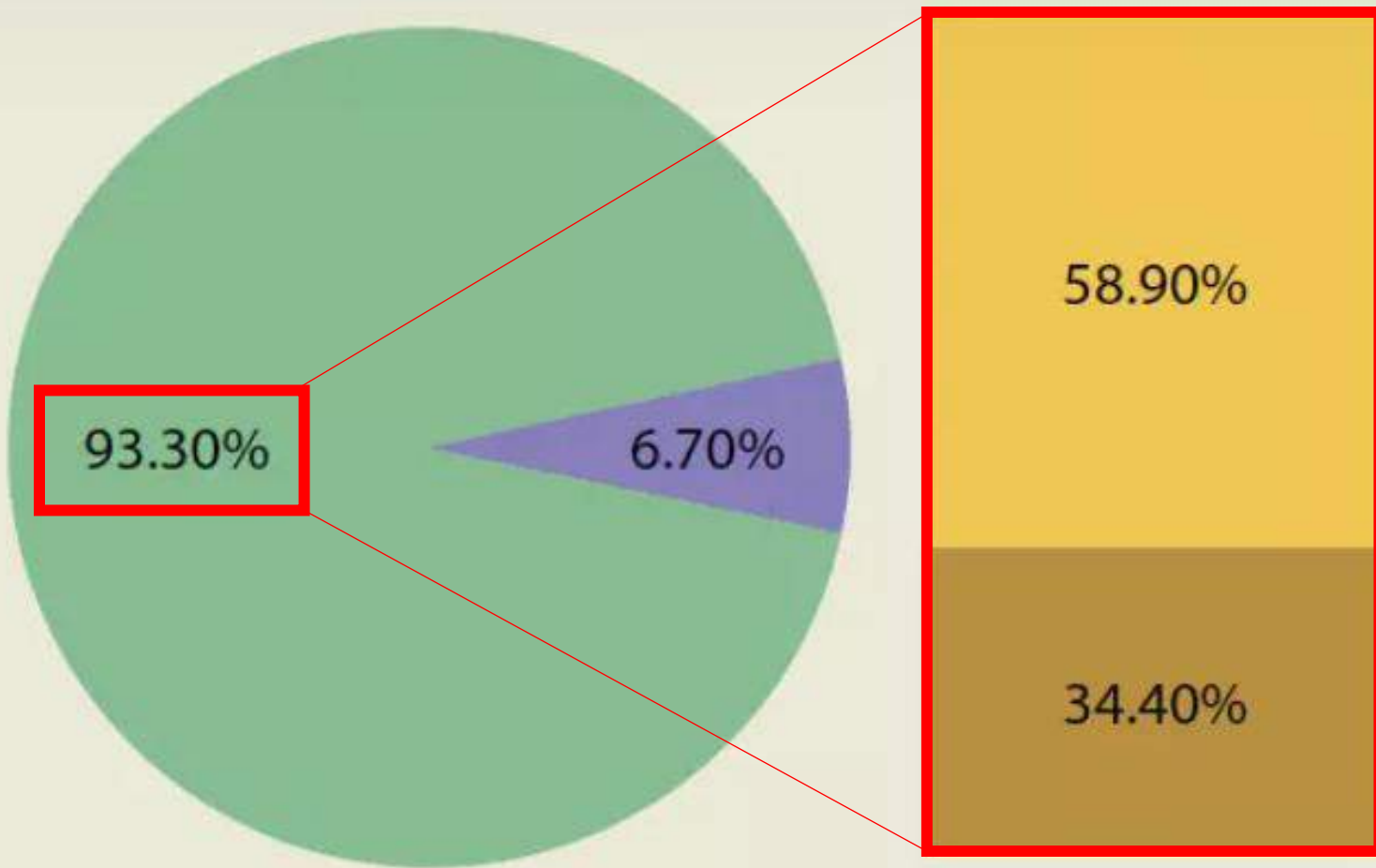
- Wear appropriate personal protection
- Avoid skin contact

First Aid Measures

- Remove victim to fresh air
- Flush affected body areas with water
- Seek medical aid

REFER TO SAFETY DATA SHEET FOR FURTHER INFORMATION

CAN CAUSE
IRRITATION
AND
HARMFUL
EFFECT TO
EYES/SKIN



■ Agriculture
 ■ Other sectors
 ■ Manure management
 ■ Agriculture Soils

**MORE THAN
50% OF
AMMONIA IS
FROM
MANURE
EMISSION**

Figure 1. Ammonia emissions, EU-28, 2013 (% of total ammonia emissions). | Source: European Environment Agency



1

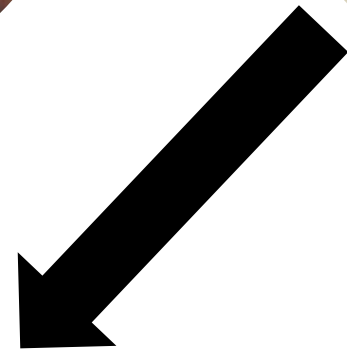
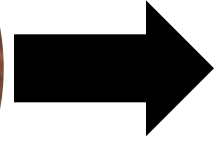
POULTRY FARMS

DIFFERENT TYPES OF POULTRY FARM

BREEDER



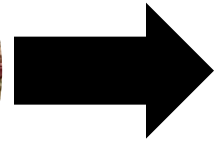
HATCHERY



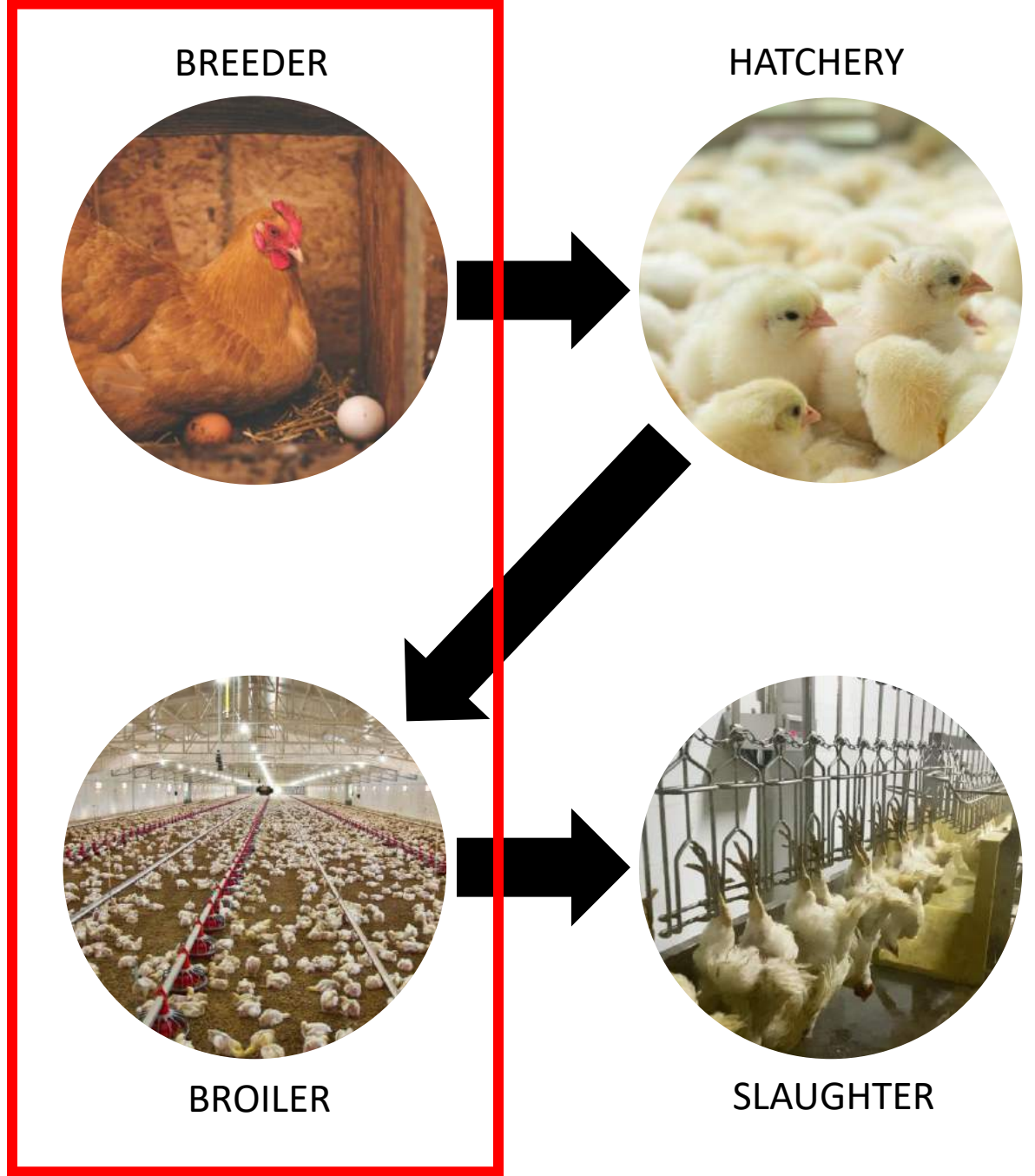
BROILER



SLAUGHTER



POTENTIALLY CORROSIVE ACTIVITIES





BREEDER FARM



Nest boxes

Bedding

Water
DESIGN OF
BREEDER
FARM
Feed

BASICALLY WHERE HENS LAY EGGS

HATCHERY INCUBATE THE EGGS INTO CHICKS



1 POULTRY FARMS

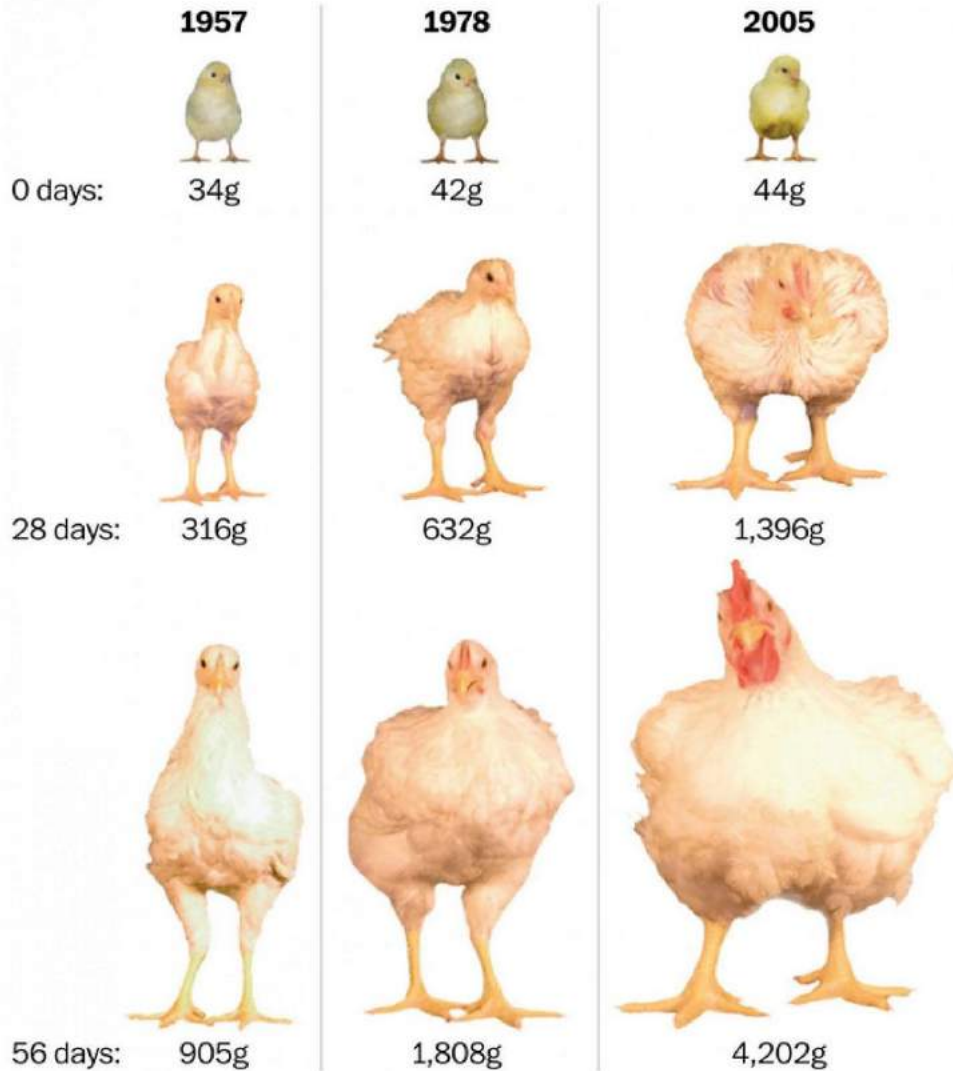
CHICKS SENT TO BROILER FARM

CHICKEN FED WITH BALANCED DIET

Source:
https://www.reddit.com/r/interestingasfuck/comments/3c6kor/the_size_of_commercially_raised_broiler_chicken/

Raising bigger chickens

The size of commercially raised broiler chickens has increased.



Note: 1,000 grams equal 2.2 pounds

Source: University of Alberta Meat Control

THE WASHINGTON POST

TO GROW BIGGER AND FASTER

Source:

https://www.reddit.com/r/interestingasfuck/comments/3c6kor/the_size_of_commercially_raised_broiler_chicken/

**INITIALLY
THERE COULD
BE SPACES
BETWEEN
BROILERS**



FULLY GROWN BROILERS

BROILER MANURE USED AS FERTILIZER

BIOLOGICAL BREAKDOWN TO RELEASE AMMONIA

Table 4. Steel corrosion rates in farmyard manure in laboratory tests at ambient temperature [5]

Manure	Equivalent metal thickness loss after 1 year(μm)	
	Mild steel	Galvanized steel
Poultry	167	160
Cattle	199	95
Controls in clean water	60	20

STUDIES SHOWN THAT FARMYARD MANURE CAN CAUSE SIGNIFICANT CORROSION



**IT IS CRUCIAL
TO HAVE
PROPER
DESIGN**

COOLING PAD WALL

VENTILATOR



TYPE 1
—
**CEMENT
FLOOR WITH
SAWDUST**



TYPE 2 — SLATTED FLOOR



1 POULTRY FARMS

PERFORATED AND RAISED



1 POULTRY FARMS

ALLOW FOR BETTER VENTILATION



1 POULTRY FARMS

**ALLOW
MANURE TO
FALL
THROUGH**

GROUND FLOOR FOR MANURE COLLECTION

GROUND FLOOR FOR MANURE COLLECTION



1 POULTRY FARMS

**MANURE CAN
BE COLLECTED
PERIODICALLY**



AUTOMATIC CONVEYOR BELT

MANURE STORAGE AREA (ROOFED)



① POULTRY FARMS

TYPE 1

—

**ROOF WITH
NOTHING
UNDERNEATH
OR WRONG
MEMBRANE
TYPE**

**STEEL PURLIN IN
CONTACT WITH
MEMBRANE
SHOWN RUSTS
(~4YEARS)**

MEMBRANE ABSORBS MOISTURE

ALLOWING
AMMONIA TO
DISSOLVE
READILY ONTO
THE MEMBRANE



AMMONIA

TYPE 2

—

ROOF WITH CLOSED CELL IMPERMEABLE BOARD

THE INSULATED BOARD DOES NOT ABSORB MOISTURE



PREVENTING REACTION WITH AMMONIA

INSULATED BOARD WAS CHIPPED AWAY BY NATURE

BIRD MADE NESTS WITHIN THE INSULATED BOARD



UNPROTECTED AREA SHOWN CORROSION



IMPORTANCE OF DETAILING

CEILING CAN HELP SHIELD THE ROOF FROM AMMONIA EXPOSURE

WHILE INSULATING THE BROILER AREA

	CHICKEN			
	Broiler Litter	Broiler Cake ¹	Roaster Litter	Breeder Litter
Moisture (%)	21.5	40.0	22.5	33.5
TS (%)	78.5	60.0	77.5	66.5
Density (lb/cu. ft.) ²	27	34 ³	27	35
Nutrient Content (lb/ton)				
NH ₄ -N	11	12	14	8
Organic-N	60	34	57	26
Nitrate-N	0.7	NR ⁴	NR	NR
Total-N	72	46	71	34
PAN				
Surface Spread	42	26	41	20
Incorporated	45	30	45	22
P ₂ O ₅	69	53	72	56
K ₂ O	46	36	46	33
Ca	44	34	42	89
Mg	8.1	7.0	8.7	7.5
S	12.1	9.2	14	8.2
Zn	0.64	0.60	0.68	0.57
Cu	0.53	0.41	0.50	0.22
Mn	0.71	0.69	0.75	0.63
Na	10	10	13	8.5
As	0.06	NR	NR	NR

OTHER
CHEMICALS
THAT'S
SIMILAR TO
FERTILIZERS

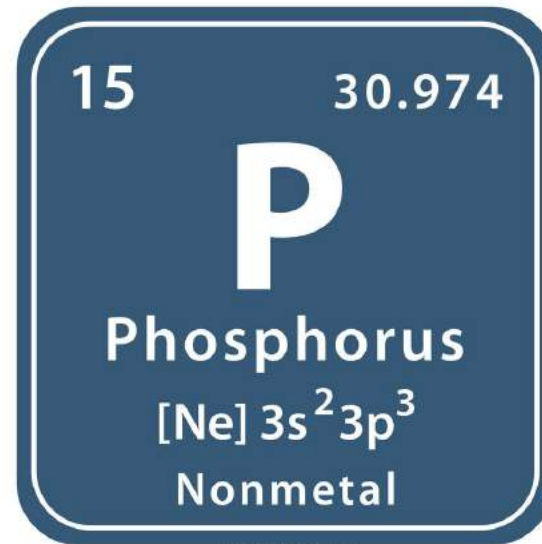


2

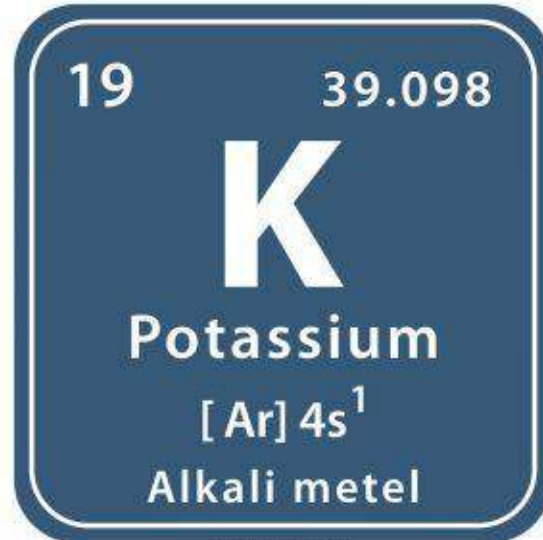
FERTILIZER FACTORY



ChemistryLearner.com



ChemistryLearner.com



ChemistryLearner.com

PRIMARY COMPONENT OF FERTILIZERS

What do the numbers on fertilizer mean?



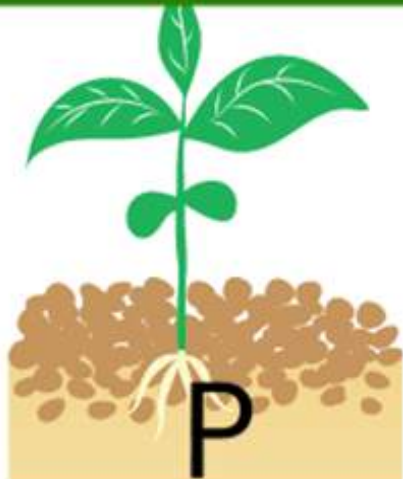
N

NITROGEN

greens up plants

JUST THINK:
↑ UP ↑

NITROGEN



P

PHOSPHORUS

reaches down to the roots and helps produce blooms

↓ DOWN ↓

PHOSPHORUS



K

POTASSIUM

promotes all around wellbeing

← ALL AROUND →

POTASSIUM

BASIC COMPONENTS OF A PLANT FERTILIZER

FERTILIZER PRODUCED FROM INDUSTRIAL SETTING



**CAN BE
REFERRED TO
AS NPK
FERTILIZER**

N	P ₂ O ₅	K ₂ O	MgO	B ₂ O ₃	TE
12	12	17	2	✓	

COMES IN
SPECIFIC
FORMULAS

CAN COME IN POWDER OR GRANULAR FORM

STORAGE OF RAW MATERIAL NORMALLY IN POWDER FORM

POWDERED FERTILIZER CAN BE AIRBORNE

SETTLING ON TOP OF MACHINES

ACCUMULATED AT PURLIN

CAUSING CORROSION EFFECT

POSING SAFETY RISKS TO THE FACTORY



ROOF LAPPED AREA

**ROOF LAPPED
AREA (NO
SEALANT
APPLIED)**

ROOF LAPPED AREA (SEALANT APPLIED)

SEALANT
APPLIED



NO
SEALANT



ROOF CONDITION FROM UNDERNEATH

ROOF CONDITION FROM UNDERNEATH

DESIGN BUILDING WITH HIGHER ROOF

**HIGHER ROOF
NOT
NECESSARY
THE ONLY
SOLUTION**

**AIRBORNE
FERTINIZER
ACCUMULATES
AT THE
STRUCTURE
AREA**

**FERTILIZER
SETTLED AT
WRAPPED
PURLIN STILL
REACTED WITH
METAL ROOF**



**ROOF WITHOUT
UNDERLINER
VS
ROOF WITH
UNDERLINER**

**SHIELD AND
PREVENT
DIRECT
CONTACT WITH
AIRBORNE
FERTILIZER**

**MAKE SURE IT IS
RIGID AND
DURABLE**



**WHAT IF
FERTILIZER IS
EMITTED
OUTSIDE THE
BUILDING?**

**THE UNWASHED
AREA WILL
ACCUMULATE
THE FERTILIZER
AND RUST**

ESPECIALLY TRUE FOR PURLIN



SAME GOES TO FASTENERS

DWARF MASONRY WALL



**PREVENT
DIRECT
CONTACT WITH
METAL WALL
CLADDING**



SUMMARY

1. POULTRY FARM

- SUFFICIENT VENTILATION
 - PROPER MANURE MANAGEMENT
- SUITABLE ROOF SYSTEMS



SUMMARY

2. FERTILIZER FACTORY

- HIGHER ROOF/CEILING
- RIGID AND DURABLE UNDERLINER
- MINIMIZE UNWASHED AREA
- DWARF MASONRY WALL



QUESTION & ANSWER SESSION

steel CONNECT



events@bluescope.com.my



nsbluescope.com/my



BlueScope Malaysia



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