



Comparative of the skull

The skull of cattle:

Dorsal surface: consists of: Frontal bone, nasal bone, incisive bone.

-Frontal bone: distinguished by presence of:

1- Torus frontalis.

2-Nuchal eminence.

3- cornual process.

-Supraorbital foramen: double represent the external opening of supraorbital canal.

- Internal opening of supraorbital canal.

-Nasal bone: narrow caudally and it's rostral end notched.

-Incisive bone: thin , without incisive alveoli . The two incisive bones are Separated by the interincisive fissure.

The lateral surface: characterized by:

-Deep & narrow temporal fossa.

-The orbital foramina are: internal opening of supraorbital canal, ethmoid foramen, optic foramen, orbitorotundum foramen.

-Presence of supraorbital canal.

-Absence of caudal alar foramen, small alar foramen and alar canal.

-Zygomatic bone has two processes: zygomatic process, frontal process.

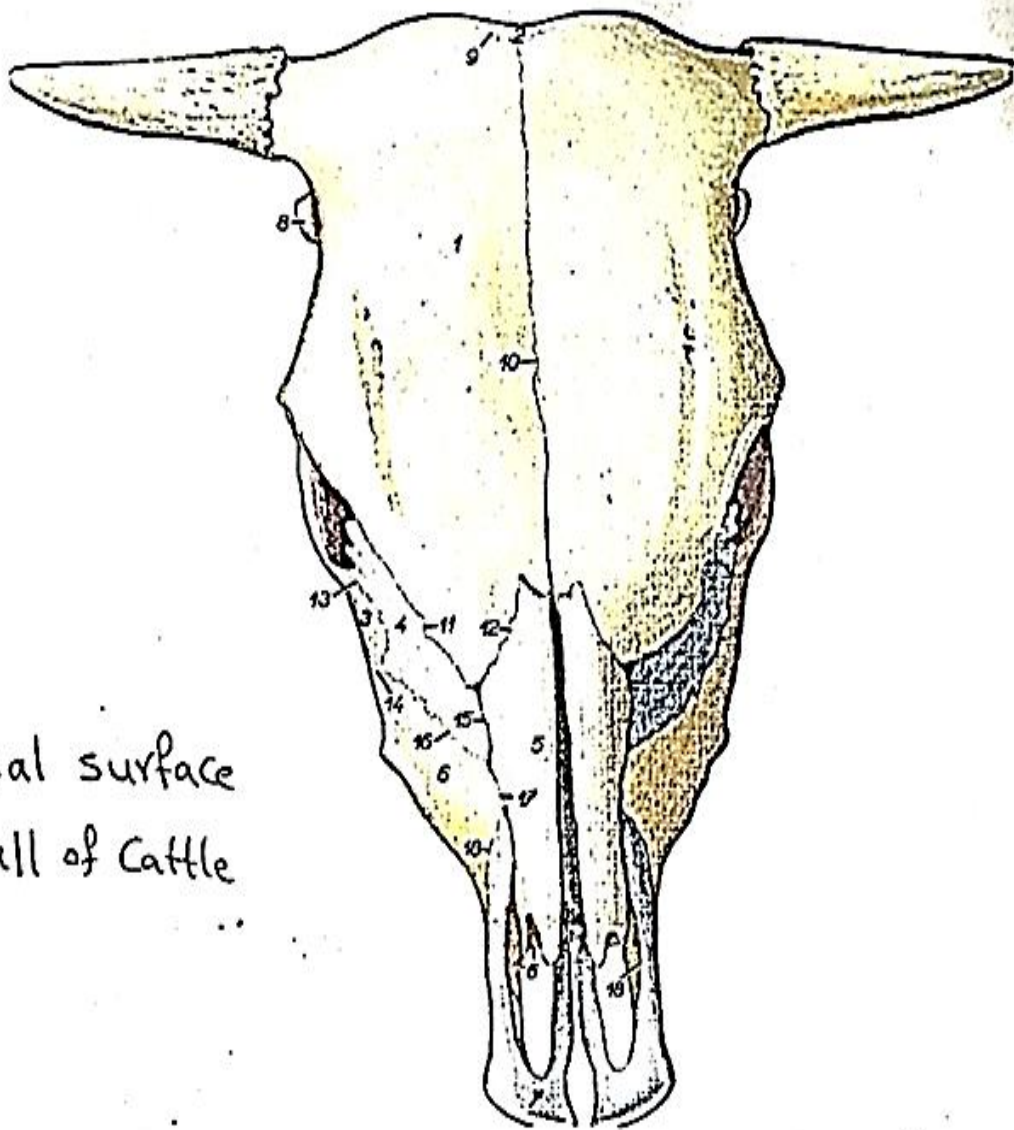


- Zygomatic arch consists from 2 processes:
 - a- Zygomatic process of temporal bone.
 - b-Zygomatic process of zygomatic bone.
- Presence of lacrimal bulla.
- Facial tuberosity instead of facial crest.

The ventral surface: characterized by:

- Condylod fossa has 2 foramen: hypoglossal foramen, condylod foramen.
- Basilar tubercles are large tuberosities.
- Tympanic bulla very large and compressed.
- Muscler process very large.
- Foramen lacerum: very small like narrow fissure.
- Oval foramen: present in wing of basisphenoid bone.
- Major palatine duct is short.
- External acoustic meatus project horizontally & laterally.
- Vomer process very low and not attached to hard palate.

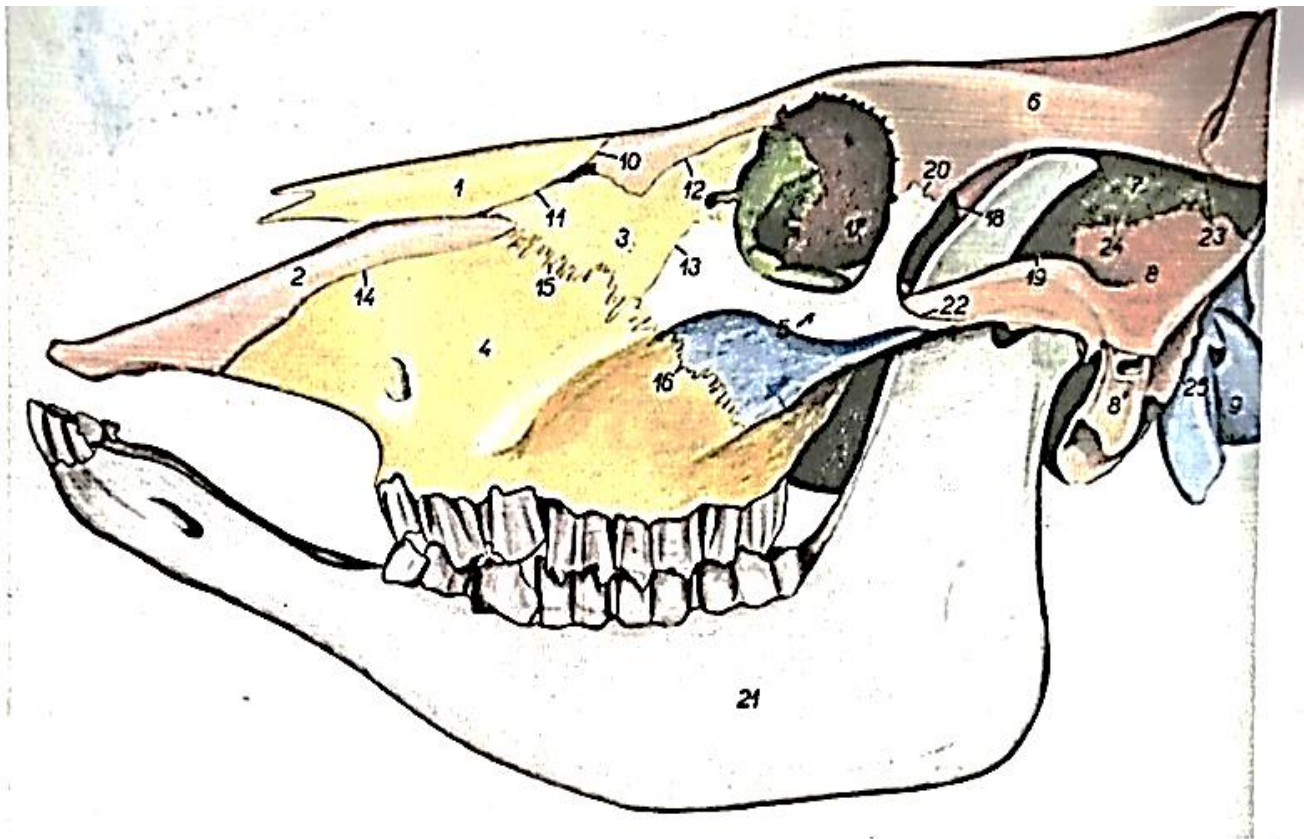




Dorsal surface
Skull of Cattle

- | | |
|--|--|
| 1. <i>os frontale</i> – frontal bone | 3. <i>sutura lacrimozygomatica</i> – lacrimozygomatic suture |
| 2. <i>os parietale</i> – parietal bone | 4. <i>sutura zygomaticomaxillaris</i> – zygomaticomaxillary suture |
| 3. <i>os zygomaticum</i> – zygomatic bone | 15. <i>sutura nasolacrimalis</i> – nasolacrimal suture |
| 4. <i>os lacrimale</i> – lacrimal bone | 16. <i>sutura lacrimomaxillaris</i> – lacrimomaxillary suture |
| 5. <i>os nasale</i> – nasal bone | 17. <i>sutura nasomaxillaris</i> – nasomaxillary suture |
| 6. <i>maxilla</i> – maxilla | 18. <i>sutura maxilloincisiva</i> – maxilloincisive suture |
| 7. <i>os incisivum</i> – incisive bone | |
| 8. <i>os temporale</i> – temporal bone | |
| 9. <i>sutura coronalis</i> – coronal suture | |
| 10. <i>sutura interfrontalis</i> – interfrontal suture | |
| 11. <i>sutura frontolacrimalis</i> – frontolacrimal suture | |
| 12. <i>sutura frontonasalis</i> – frontonasal suture | |

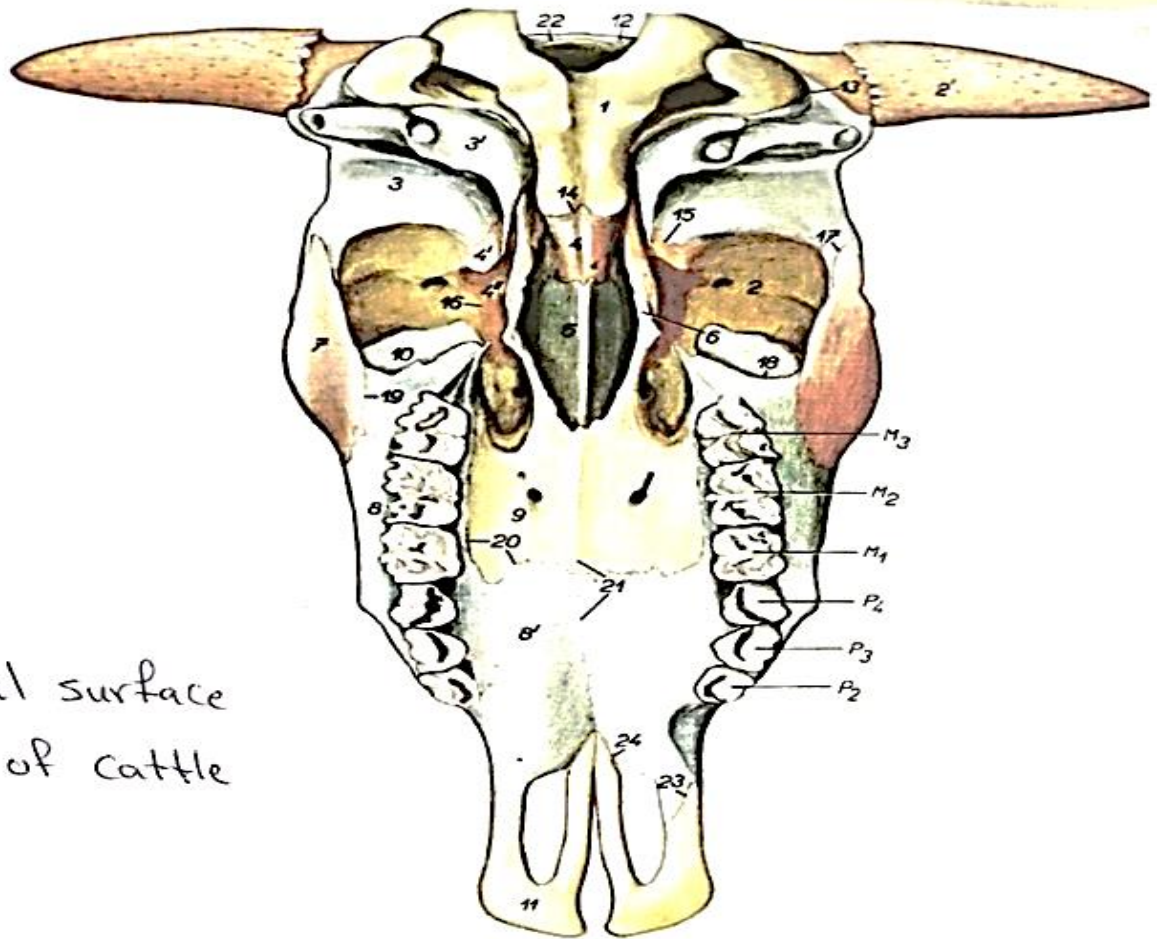




1. *os nasale* – nasal bone
2. *os incisivum* – incisive bone
3. *os lacrimale* – lacrimal bone
4. *maxilla* – maxilla
5. *os zygomaticum* – zygomatic bone
6. *os frontale* – frontal bone
7. *os parietale* – parietal bone
8. *pars squamosa ossis temporalis* – squamous part of temporal bone
- 8'. *pars tympanica ossis temporalis* – tympanic part of temporal bone
9. *os occipitale* – occipital bone
10. *sutura frontonasalis* – frontonasal suture
11. *sutura nasolacrimalis* – nasolacrimal suture
12. *sutura frontolacrimalis* – frontolacrimal suture
13. *sutura lacrimozygomatica* – lacrimozygomatic suture
14. *sutura maxilloincisiva* – maxilloincisive suture
15. *sutura lacrimomaxillaris* – lacrimomaxillary suture
16. *sutura zygomaticomaxillaris* – zygomaticomaxillary suture
- 17., 18. *sutura sphenofrontalis* – sphenofrontal suture
19. *sutura sphenoparietalis* – sphenoparietal suture
20. *sutura frontozygomatica* – frontozygomatic suture
21. *mandibula* – mandible
22. *sutura temporozygomatica* – temporozygomatic suture
23. *sutura coronalis* – coronal suture
24. *sutura squamosa* – squamous suture
25. *sutura occipitomastoidea* – occipitomastoid suture

Lateral surface
Skull of Cattle





Ventral surface
Skull of cattle

1. *os occipitale* — occipital bone
2. *pars orbitalis ossis frontalis* — orbital part of frontal bone
- 2'. *processus cornualis ossis frontalis* — cornual process of frontal bone
3. *pars squamosa ossis temporalis* — squamous part of temporal bone
- 3'. *pars tympanica ossis temporalis* — tympanic part of temporal bone
4. *corpus ossis sphenoidalis (basisphenoidalis et praesphenoidalis)* — body of sphenoid (basisphenoid and presphenoid) bone
- 4'. *ala ossis basisphenoidalis (ala temporalis)* — wing of basisphenoid bone (temporal wing)
- 4''. *ala ossis praesphenoidalis (ala orbitalis)* — wing of presphenoid bone (orbital wing)
5. *vomer* — vomer
6. *os pterygoideum* — pterygoid bone
7. *os zygomaticum* — zygomatic bone
8. *maxilla* — maxilla
- 8'. *processus palatinus maxillae* — palatine process of maxilla
9. *os palatinum* — palatine bone
10. *os lacrimale* — lacrimal bone
11. *os incisivum* — incisive bone
12. *os parietale* — parietal bone
13. *sutura occipitomastoidea* — occipitomastoid suture
14. *synchondrosis sphenoccipitalis* — spheno-occipital synchondrosis
15. *sutura sphenosquamosa* — sphenosquamous suture
16. *sutura sphenofrontalis* — sphenofrontal suture
17. *sutura temporozygomatica* — temporozygomatic suture
18. *sutura lacrimomaxillaris* — lacrimomaxillary suture
19. *sutura zygomaticomaxillaris* — zygomaticomaxillary suture



The skull of sheep & goat:

Dorsal surface: characterized by:

- Quadrishape parietal plate.
- Frontal bone form cornual processes or round tuberosities.
- Nasal bone :pointed rostrally (similar to that of horse).
- Supraorbital canal (similar to that of cow).
- Incisive bone: pointed narrow body, its palatine process is very narrow with long palatine fissure.

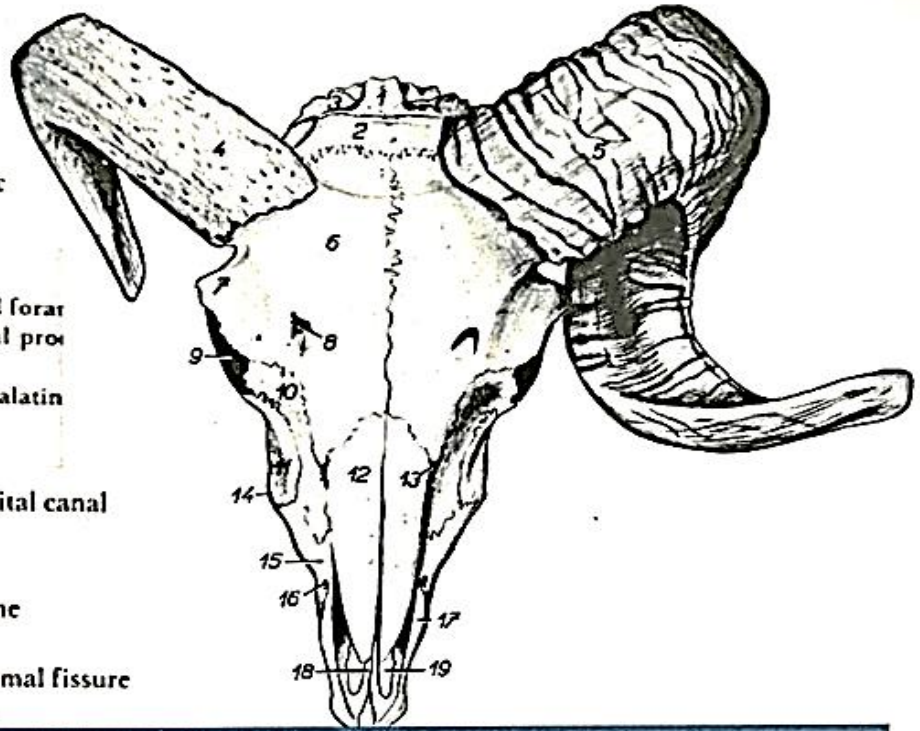
Lateral surface: characterized by:

- Zygomatic bone form two processes; frontal & zygomatic processes.
- Zygomatic bone & lacrimal bone together form the external lacrimal fossa.
- Small lacrimal bulla.
- Facial tuberosity.
- External acoustic meatus project dorsolaterally (similar to that of horse).



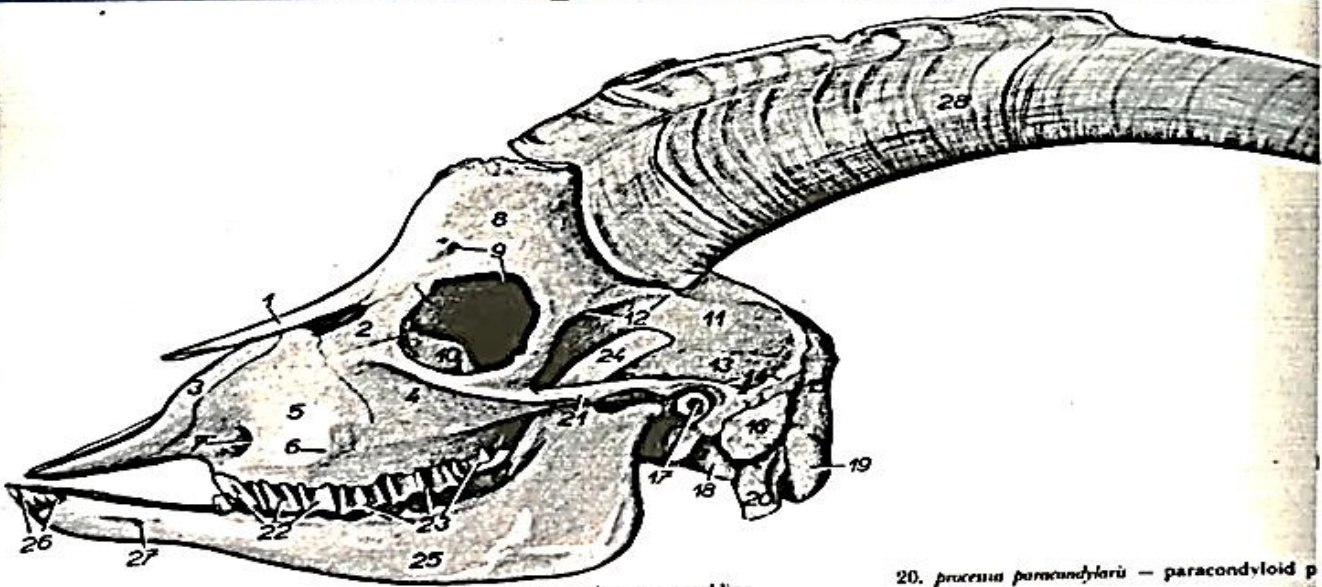
Sheep. Skull of ram. View of the dorsal surface showing left horn and right cornual process.

1. *os occipitale* – occipital bone
2. *os parietale* – parietal bone
3. *os interparietale* – interparietal bone
4. *processus cornualis* – cornual process
5. *cornu* – horn
6. *os frontale* – frontal bone
7. *processus zygomaticus ossis frontalis* – zygomatic process of frontal bone



15. *maxilla* – maxilla
16. *foramen infraorbitale* – infraorbital forat
17. *processus nasalis ossis incisivi* – nasal process of incisive bone
18. *processus palatinus ossis incisivi* – palatine process of incisive bone
19. *fissura palatina* – palatine fissure
8. *canalis supraorbitalis* – supraorbital canal
9. *orbita* – orbit
10. *os lacrimale* – lacrimal bone
11. *os zygomaticum* – zygomatic bone
12. *os nasale* – nasal bone
13. *fissura nasolacrimalis* – nasolacrimal fissure
14. *tuber faciale* – facial tuberosity

Goat. Male goat. Skull, left view.



1. *os nasale* – nasal bone
2. *os lacrimale* – lacrimal bone
3. *os incisivum* – incisive bone
4. *os zygomaticum* – zygomatic bone
5. *maxilla* – maxilla
6. *tuber faciale* – facial tuber
7. *foramen infraorbitale* – infraorbital foramen
8. *os frontale* – frontal bone
9. *canalis supraorbitalis* – supraorbital canal
10. *bulbus lacrimalis* – lacrimal bulla
11. *os parietale* – parietal bone

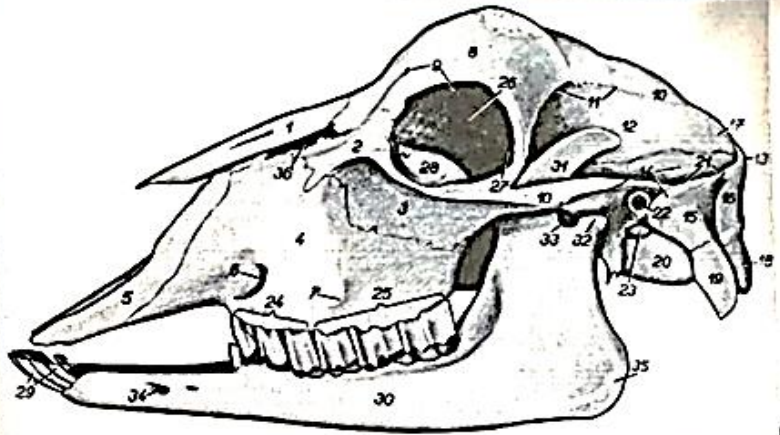
12. *linea temporalis* – temporal line
13. *pars squamosa ossis temporalis* – squamous part of temporal bone
14. *crista temporalis* – temporal crest
15. *squama occipitalis* – occipital squama
16. *processus mastoideus ossis temporalis* – mastoid process of temporal bone
17. *porus acusticus externus* – external acoustic opening
18. *bulbus tympanicus* – tympanic bulla
19. *condylus occipitalis* – occipital condyle

20. *processus paracondylaris* – paracondyloid process
21. *arcus zygomaticus* – zygomatic arch
22. *dentes premolares* – premolar teeth
23. *dentes molares* – molar teeth
24. *processus coronoideus mandibulae* – coronoid process of mandible
25. *corpus mandibulae* – body of mandible
26. *dentes incisivi* – incisors
27. *foramen mentale* – mental foramen
28. *cornu* – horn



Goat (without horn). Skull, lateral view

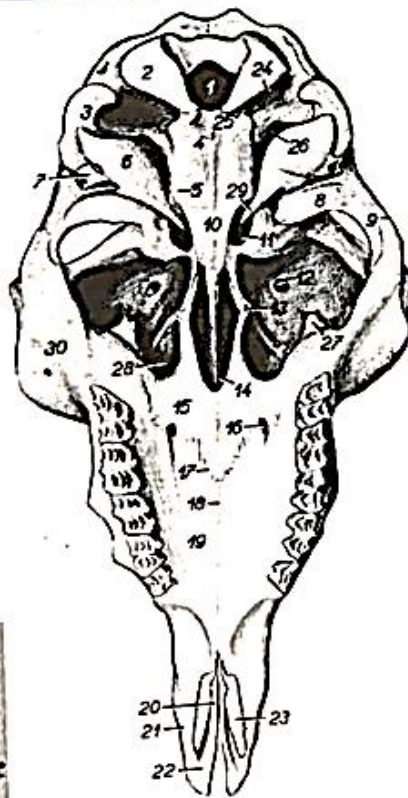
1. *os nasale* – nasal bone
2. *os lacrimale* – lacrimal bone
3. *os zygomaticum* – zygomatic bone
4. *maxilla* – maxilla
5. *os incisivum* – incisive bone
6. *foramen infraorbitale* – infraorbital foramen
7. *tuber faciale* – facial tuber
8. *os frontale* – frontal bone
9. *canalis supraorbitalis* – supraorbital canal
10. *os parietale* – parietal bone
11. *linea temporalis* – temporal line
12. *fossa temporalis* – temporal fossa
13. *protuberantia occipitalis externa* – external occipital protuberance
14. *pars squamosa assis temporalis* – squamous part of temporal bone
15. *processus mastoideus assis temporalis* – mastoid process of temporal bone
16. *squama occipitalis* – occipital squama
17. *os interparietale* – interparietal bone
18. *condylus occipitalis* – occipital condyle
19. *processus paracondylaris* – paracondyloid process
20. *bulla tympanica* – tympanic bulla
21. *crista temporalis* – temporal crest
22. *porus acusticus externus* – external acoustic opening
23. *processus styloideus* – styloid process



24. *dentes premolares* – premolar teeth
25. *dentes molares* – molar teeth
26. *foramen ethmoidale* – ethmoid foramen
27. *canalis opticus* – optic canal
28. *bulla lacrimalis* – lacrimal bulla
29. *dentes incisivi* – incisors
30. *mandibula* – mandible
31. *processus coronoideus mandibulae* – coronoid process of mandible
32. *processus condylaris mandibulae* – condyloid process of mandible
33. *incisura mandibulae* – incisure of mandible
34. *foramen mentale* – mental foramen
35. *angulus mandibular* – angle of mandible
36. *fissura nasolacrimalis* – nasolacrimal fissure

Goat. Skull, ventral view

1. *foramen magnum* – foramen magnum
2. *condylus occipitalis* – occipital condyle
3. *processus paracondylaris* – paracondyloid process
4. *pars basilaris assis occipitalis* – basilar part of occipital bone
5. *tuberculum musculare* – muscular tubercle
6. *bulla tympanica* – tympanic bulla
7. *porus acusticus externus* – external acoustic opening
8. *tuberculum articulare* – articular tubercle
9. *arcus zygomaticus* – zygomatic arch
10. *corpus assis basisphenoidalis* – body of basisphenoid bone
11. *foramen osale* – oval foramen
12. *canalis supraorbitalis* – supraorbital canal
13. *hamulus pterygoideus* – pterygoid hamulus
14. *choana* – choana
15. *os palatinum* – palatine bone
16. *foramen palatinum majus* – greater palatine foramen



17. *sutura palatina transversa* – transverse palatine suture
18. *sutura palatina mediana* – median palatine suture
19. *processus palatinus maxillae* – palatine process of maxilla
20. *processus palatinus assis incisivi* – palatine process of incisive bone
21. *processus nasalis assis incisivi* – nasal process incisive bone
22. *corpus assis incisivi* – body of incisive bone
23. *fissura palatina* – palatine fissure
24. *canalis condylaris* – condylar canal
25. *canalis ni. hypoglossi* – canal of hypoglossal nerve
26. *foramen jugulare* – jugular foramen
27. *bulla lacrimalis* – lacrimal bulla
28. *foramen sphenopalatinum* – sphenopalatine foramen
29. *processus muscularis* – muscular process
30. *os zygomaticum* – zygomatic bone



The skull of dog:

Dorsal surface: consists of:

Parietal bone, interparietal bone, frontal bone, nasal bone & incisive bone.

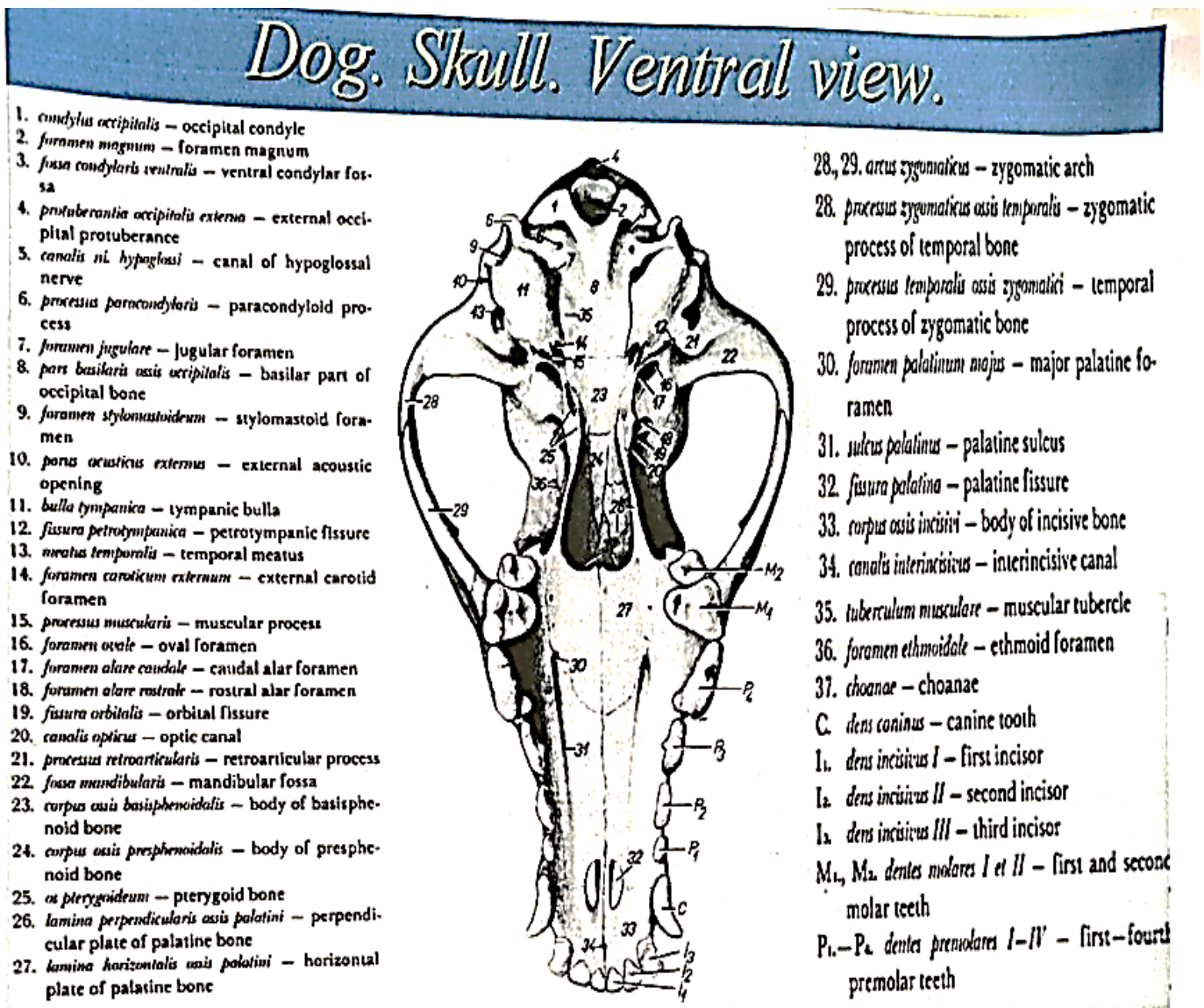
-Parietal crest.

-Very short zygomatic process of frontal bone.

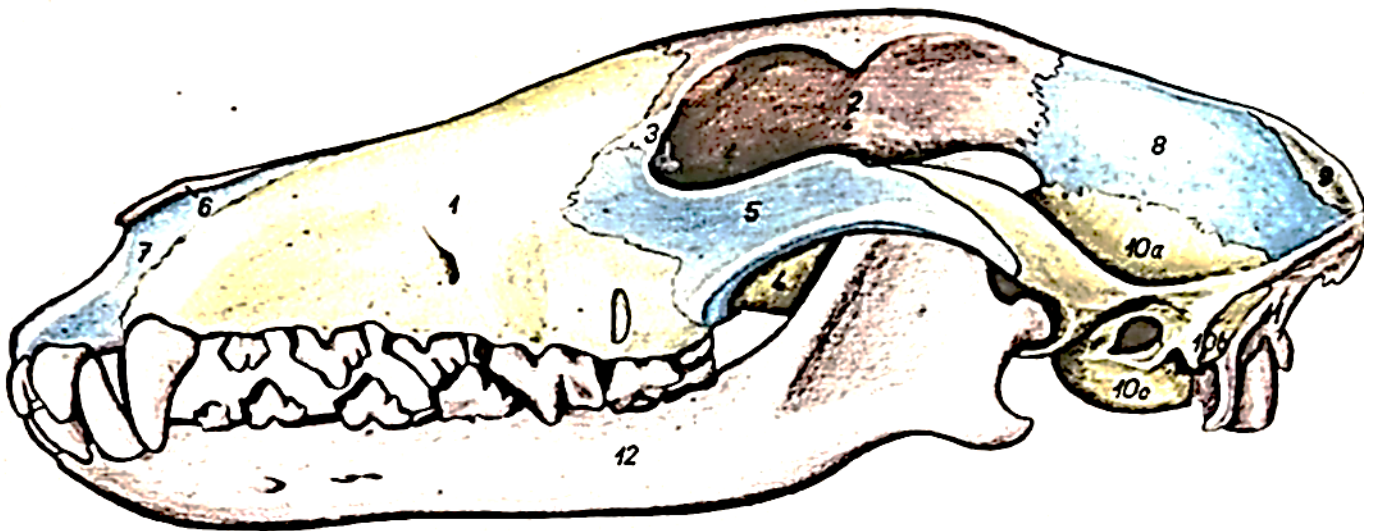
-Semicircular nasal notch rostrally.

-Big round tympanic bulla.

-Incisive bone compressed dorsoventrally, and hold incisor teeth.



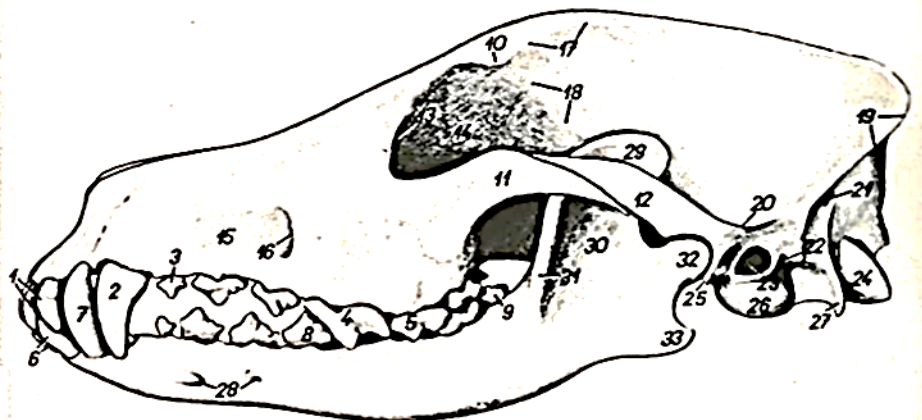
Dog. Left view of skull. Bone outlines demarcated by color.



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| 1. <i>maxilla</i> – maxilla | 7. <i>os incisivum</i> – incisive bone | 10b. <i>processus mastoideus assis temporalis</i> – mastoid process of temporal bone |
| 2. <i>os frontale</i> – frontal bone | 8. <i>os parietale</i> – parietal bone | 10c. <i>pars tympanica assis temporalis</i> – tympanic part of temporal bone |
| 3. <i>os lacrimale</i> – lacrimal bone | 9. <i>os interparietale</i> – interparietal bone | 11. <i>os occipitale</i> – occipital bone |
| 4. <i>lamina perpendicularis assis palatini</i> – perpendicular plate of palatine bone | 10. <i>os temporale</i> – temporal bone | 12. <i>mandibula</i> – mandible |
| 5. <i>os zygomaticum</i> – zygomatic bone | 10a. <i>pars squamosa assis temporalis</i> – squamous part of temporal bone | |
| 6. <i>os nasale</i> – nasal bone | | |

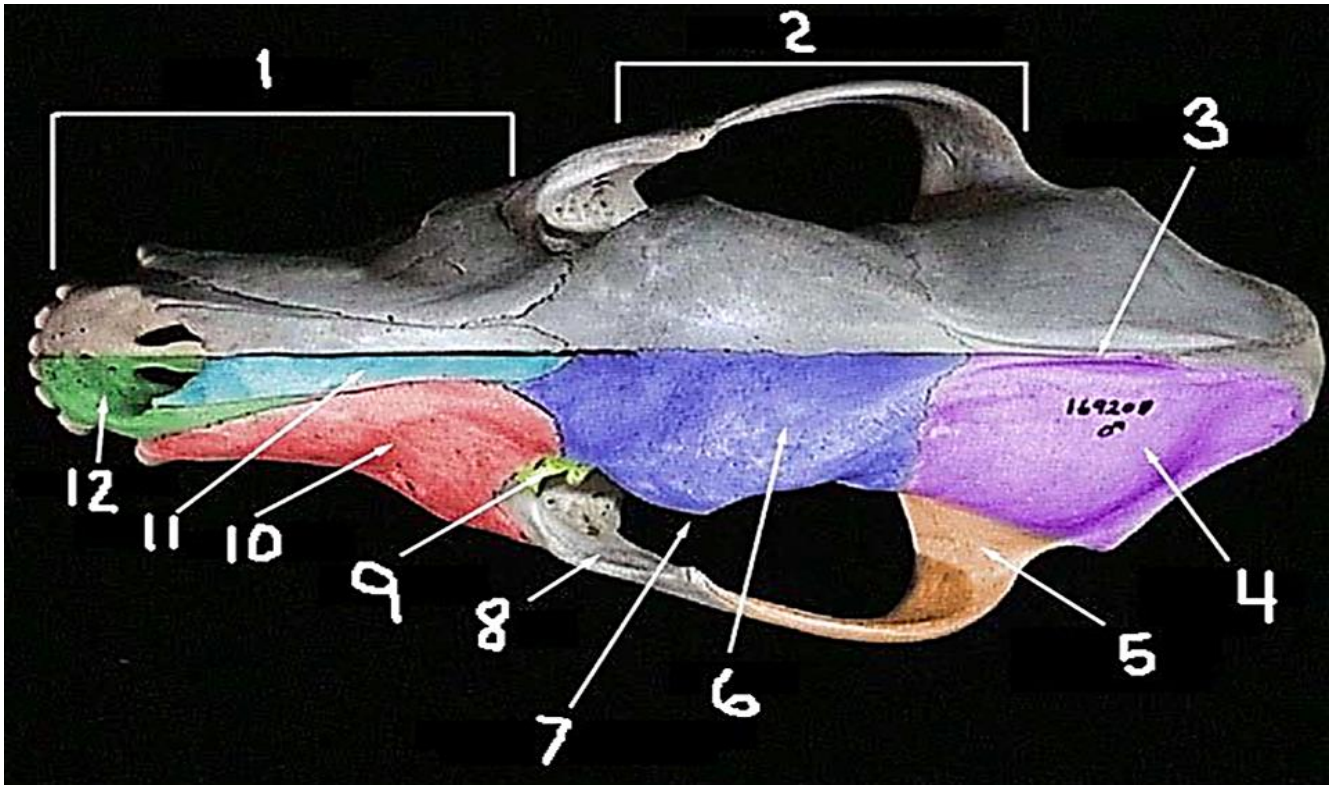
Dog. Left view of skull.

1. *dentes incisivi maxillares* – upper incisors
2. *dens caninus maxillaris* – upper canine tooth
3. *dens premolaris maxillaris I* – upper first premolar tooth
4. *dens premolaris maxillaris IV* – upper fourth premolar tooth
5. *dens molaris maxillaris I* – upper first molar tooth
6. *dentes incisivi mandibulares* – lower incisors
7. *dens caninus mandibularis* – lower canine tooth
8. *dens premolaris mandibularis IV* – lower fourth premolar tooth
9. *dens molaris mandibularis III* – lower third molar tooth
10. *processus zygomaticus assis frontalis* – zygomatic process of frontal bone
- 11, 12. *arcus zygomaticus* – zygomatic arch
11. *processus temporalis assis zygomatici* – temporal process of zygomatic bone
12. *processus zygomaticus assis temporalis* – zygomatic process of temporal bone
13. *fossa sacri lacrimalis* – fossa of lacrimal sac
14. *orbita* – orbit
15. *fossa canina* – canine fossa
16. *foramen infraorbitale* – infraorbital foramen
17. *linea temporalis* – temporal line
18. *crista orbitotemporalis* – orbitotemporal crest
19. *crista nuchae* – nuchal crest
20. *crista temporalis* – temporal crest
21. *foramen supramastoideum* – supramastoid foramen



- | | |
|---|---|
| 22. <i>foramen stylomastoideum</i> – stylomastoid foramen | 28. <i>foramina mentalia</i> – mental foramen |
| 23. <i>porus acusticus externus</i> – external acoustic opening | 29. <i>processus coronoides mandibulae</i> – coronoid process of mandible |
| 24. <i>condylus occipitalis</i> – occipital condyle | 30. <i>fossa masseterica</i> – masseteric fossa |
| 25. <i>processus retroarticularis</i> – retroarticular process | 31. <i>crista muscularis</i> – muscular crest |
| 26. <i>bulla tympanica</i> – tympanic bulla | 32. <i>processus condylaris</i> – condyloid process |
| 27. <i>processus paracondylaris</i> – paracondyloid process | 33. <i>processus angularis</i> – angular process |





1 Maxillary region; 2 orbital region; 3 interparietal bone; 4 Parietal bone; 5 Zygomatic process of temporal bone; 6 Frontal bone; 7 Zygomatic process of frontal bone (very short); 8 Zygomatic process of zygomatic bone; 9 fossa of lacrimal canal; 10 Maxillary bone; 11 Nasal bone; 12 Incisive bone.

