

*SHORT REPORT*

## **A case of ostrich (*Struthio camelus*) twins developing from a double-yolked egg**

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On July 4, 2002 at a Polish ostrich farm, Ożarów, a case of ostrich (*Struthio camelus*) twins developing from a double-yolked egg was reported. On the day of laying the weight of egg was 2221 g, whereas its shape index was 73.7, resembling the chicken egg. On day 43 of incubation the egg was opened. Each embryo was fully formed with complete feathers. Both embryos died in the last stage of incubation, on day 33 or 34. The embryos were lying with their ventral surfaces opposed with the yolk sacs positioned between them. The embryos weighed 245.2 g (twin 1) and 259.3 g (twin 2). This case report is unique and it is hoped that it will provide a valuable contribution to the current literature on ostrich eggs.

**KEY WORDS:** double-yolked egg / embryo / ostrich / twins

The phenomenon of avian twinning is particularly rare and was first described in the first half of the 20th century by Waddington [1941], Nalbandov [1942] and Sturkie [1946]. Waddington [1941] reported a rare case of viable twin chicks. In the *Ratitae* twins were reported in the African ostrich by Deeming [1997] and Horbańczuk *et al.* [2001], and in the Australian emu by Bassett *et al.* [1999]. In the case of the ostrich only one embryo survived for several hours after hatching and the remaining three died in the last stage of incubation, whereas in the emu twins survived into juveniles.

The present case of ostrich twins developing from a double-yolked egg occurred on July 4, 2002 at Ożarów farm, Poland. The egg was laid during the peak period by a 5-year old female in her third year of laying, as egg 18 out of the total of 50. On the day of laying the weight of the egg was 2221 g and was higher by about 45% than the mean reported for ostriches by Deeming and Ar [1999]. On domestic farms the mean egg mass is about 1600 g, usually ranging from 1200 to 1800 g [Horbańczuk 2002]. The first author of this paper during the past nine years analysed 30,000 ostrich eggs and until now has never found a double-yolked egg. However, Huchzermeyer [2000] indicates that in emu, double-yolked eggs are laid more often than in other *Ratitae*.

The shape index of the investigated egg was 73.7, resembling the chicken egg. According to Reiner *et al.* [1995] the mean value of the ostrich egg shape index amounts to almost 83 (ranging from 80 to 85). However, Horbańczuk [2002] showed that the ostrich egg shape index was 84-85; usually the ostrich egg is more spherical than the chicken egg. The length of an ostrich double-yolked egg was 190 mm, its width amounted to 140 mm, and its circumference over the top to 510 mm. According to Reiner *et al.* [1995] mean length of an ostrich egg is 155 mm, and circumference over the top 440 mm.

The weight loss during incubation of a double-yolked egg (see below) was lower than recommended by Horbańczuk [2000] or Stewart [1992]. This indicates that there was inadequate gaseous exchange between the egg and the outer environment.

On day 43 of incubation the egg was opened. Each embryo was found fully formed

Characteristics of the female and selected morphological parameters of double-yolked egg

Parameter	Value
Age of female (year)	5
Year of egg production	3
Egg weight (g)	2221
Egg length (mm)	190
Egg width (mm)	140
Shape index	73.7
Total egg weight loss during incubation (%)	10.0

with complete feathers. Both embryos died at the same stage of incubation, *i.e.* on day 33 or 34. The embryos were found lying with their ventral surfaces opposed with the yolk sacs positioned between them, and weighed 245.2 g (twin 1) and 259.3 g (twin 2).

The results of morphometric measurements and masses of selected internal organs are shown in Table 1. Gross examination of the viscera indicated that all organs were well developed and were present in each twin. The sizes of heart and liver did not differ between the twins, which confirmed that they died at the same stage of incubation.

Both embryos were smaller than those developing from the single-yolked egg

**Table 1.** Morphometric measurements and mass of selected internal organs of twin ostrich embryos

Item	Twin 1	Twin 2
Bodyweight (g)	245.2	259.3
Head length (cm)	5.6	5.4
Neck circumference (cm)	2.6	2.7
Tibiotarsus length (cm)	5.7	5.6
Tarsometatarsus length (cm)	4.3	4.3
Wing length (cm)	4.6	4.8
Body length (cm)	20.6	20.9
Heart mass (g)	13	13
Liver mass (g)	4.2	4.4

described by Horbańczuk *et al.* [2001]. In their report, however, one embryo remained alive several hours after hatching and the second died at day 39 of incubation.

This case report is unique and it is hoped that it will provide a valuable contribution to the current literature on ostrich eggs.

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### Przypadek bliźniąt strusia (*Struthio camelus*) w jaju o dwóch żółtkach

#### Streszczenie

Przypadek stwierdzono 4 lipca 2002 na fermie strusi w Ożarowie. Masa dwużółtkowego jaja wynosiła 2221 g, a indeks kształtu 73,7, podobny do indeksu jaja kury. Jajo otworzono w 43 dniu inkubacji. Oba zarodki okazały się całkowicie wykształcone, z kompletnym opierzeniem. Oba zamarły prawdopodobnie w 33 lub 34 dniu inkubacji. Skierowane były ku sobie stronami brzuszными, a woreczki żółtkowe leżały między nimi. Masa zarodków wyniosła 245,2 i 259,3 g. Zamieszczono parametry jaja, a także wybrane wymiary ciała oraz masę serca i wątroby zarodków.