

# Deviations of exterior characters from breeding standards of chicken – part I: medium-weight breeds

## Abstract

Determining breeding value by judging the exterior of poultry has always been a comprehensive issue. Breeding standards represent a detailed description of the appearance that characterizes the ideal representative of the given breed. They are listed in the current sample of poultry breeds. There is also a list of shortcomings – deviations from the ideal. This study briefly approaches the issue of assessing the external morphological features of selected breeds of chicken. The content is also focused on the evaluation of exterior signs – their advantages and deviations according to breeding standards in selected breeds of chicken that were judged at 9 exhibitions in 5 positions according to a valid Standards. In the study was used information from six breeds of chicken – Amrock, New Hampshire Red, Oravka, Plymouth Rock, Sussex and Wyandotte – in a total number of 719 individuals. Most exterior deficiencies were recorded in the first, third and fourth position. Among the most frequent exterior deficiencies in the first position - Breeding and sexual expression were lower weight, smaller body frame or weakly muscled body. In the third position – Body shape, the most shortcomings were noted insufficient body shape, poorly carried and feathered tail and non-standard posture. Shortcomings in fourth position - Feathers included poor colour or drawing, folds in the wings, sparse plumage on the tail, folds in the wings, sparse plumage and feathers on the legs. Thanks to these obtained data, in the future it is possible to avoid exterior defects, which appear more often in the monitored breeds.

**Keywords:** amrock, new hampshire red, oravka, plymouth rock, assessment, breeding standard

Volume 7 Issue 1 - 2023

Šimon Halás,<sup>1</sup> Ivana Baranová,<sup>1</sup> František Zigo,<sup>1</sup> Juliana Arvaiová,<sup>1</sup> Zuzana Farkašová,<sup>1</sup> Illia Siedoi,<sup>1</sup> Zuzana Lacková,<sup>1</sup> Silvia Ondrašovičová,<sup>2</sup> Ibrahim F Rehan<sup>3,4</sup>

<sup>1</sup>Department of Nutrition and Animal Husbandry, University of Veterinary Medicine and Pharmacy, Slovakia

<sup>2</sup>Department of Biology and Physiology, University of Veterinary Medicine and Pharmacy, Slovakia

<sup>3</sup>Department of Husbandry and Development of Animal Health, Faculty of Veterinary Medicine, Menoufia University, Egypt

<sup>4</sup>Department of Pathobiochemistry, Faculty of Pharmacy, Meijo University Yagotoyama, Japan

**Correspondence:** František Zigo, University of Veterinary Medicine and Pharmacy in Košice, Department of Nutrition and Animal Husbandry, Košice, Komenského 73, 040 01, Slovakia, Tel +421-908-689-722, Email frantisek.zig@uvlf.sk

**Received:** November 28, 2022 | **Published:** January 04, 2023

## Introduction

In the imagination of the public, poultry farming is mostly perceived as breeding for the purpose of producing eggs, meat or feathers. For this purpose, many breeds of domestic chickens were bred mainly by artificial selection in the holdings and their crossing with each other. The aim of breeding new breeds was, for example, to grow breeds that have a high egg-laying, or to grow fleshy heavy breeds or sports breeds of unusual appearance intended for exhibitions. In this case, modifications were already made to the purpose of the treatments, preference was given to appearance over performance.<sup>1</sup>

In general, we distinguish light breeds, heavy breeds with versatile performance, and sporty breeds. When breeding and selecting individual breeds of chickens, the breeders must meet the demanding criteria of breeding standards. The emphasis is mainly on the performance characteristics and appearance of the breed, which should be as close as possible to the ideal standard of the breed in question. This is a very difficult process, which is carried to participate in poultry exhibitions.<sup>2</sup>

A set of standards of individual breeds for a given animal species can be found in patterns found in both digital and print form. Breeding standards inform both the professional and lay public about the requirements for quantitative and qualitative external features of animals of a given breed – these include, for example, weight, body shape, length, width, torso depth, size of the head or other parts of the body, thus setting the standard for the ideal appearance of a particular breed.<sup>3</sup>

They also give a description of the properties that are perceived as defects permissible and defects inadmissible. Those inadmissible defects can knock the evaluated animal out of breeding. Compliance with the necessary breeding features is assessed by highly specialized specialists for the breed, who are called assessors at exhibitions and

who evaluate the overall appearance of the exhibited animal. The assessors then present their findings and assessment in the animal's valuation letter.<sup>3,4</sup> The aim of this work was to study and compare exterior and morphological changes in selected utility breeds of chickens according to current patterns at animal exhibitions organized under the auspices of the Slovak Breeders' Association.

## Material and methods

### Selection of chicken breeds

Due to the high number of chicken breeds and extensive definitions of their standards, six breeds from medium-weight category were selected for this study. They are those most often presented at exhibitions and represent the most valuable breeding core of the whole group because they belong to the combined utility type with good meat and laying performance. Our study included Amrock (AM), New Hampshire Red (NH), Oravka (OR), Plymouth Rock (PL), Sussex (SU) and Wyandotte (W). The exterior of 719 chickens of selected breeds was judged at 9 exhibitions during the years 2019 and 2021. Of the 719 chickens on display, 98 pcs were AM, 171 pcs were NH, 198 pcs were OR, 155 pcs were OR, 45 pcs were SA and 53 pcs were W (Table 1).

### Standard of selected breeds of chickens

Amrock (AM) is a medium-weight meat-bearing breed, native to the USA. This breed was created by breeding striped shallows and it is characterized by high laying and good meat production. By default, the weight of the AM rooster varies from 3 to 4 kg, in the case of the AM hen it is in the range of 2.5 kg to 3 kg. If we talk about the colour of the plumage and the colour spurs, then in the case of AM, the colour base is black, with parallel gray-white stripes stretching through the entire plumage. Discarding defects of breeding features include a longer beak of pointed shape; dull eye; deep-lying eye;

small and shorter torso; high or narrow posture; long claws; poorly developed belly of the hen. Discarding defects in plumage colour and AM colours include one white pen; two or more total black pens in the rudder feathers or in the squadrons of the first and second rows; missing or too narrow striping of the undercoat; for roosters every brass sheen, for hens a pronounced brass sheen; sharp striping transitions.<sup>5</sup>

New Hampshire Red (NH) belongs to the fast-growing breed of chickens of the medium-weight type with high meat and egg production. The origin of this breed is in the United States of America. By default, the weight of the rooster varies from 3 to 3.5 kg, in hens the weight is from 2 to 2.25 kg. In the case of plumage colour and colour spurs, it is golden brown, white, golden-brown-blue drawn or copper-red. The knock-out defects of breeding traits in NH are too small torso, thick or too fine bones, straight back, underdeveloped hen belly, other than the yellow colour of the legs. The knock-out defects of colour plumage and colour surges include a strong spotting in the golden-brown colour NH; too light or dark plumage; drawing in a saddle hinge; black colour in the top plumage and in the shields of the wings; yellow tinge in white-coloured NH; too light or dark basic colouring in golden brown-blue drawn NH, also a striking blue colour or erroneous drawing is a minus for the exhibited breed NH.<sup>6</sup>

Oravka (OR) belongs to medium-weight breed and the origin is in Slovakia. It is characterized by adaptability to different climatic conditions and changes. The weight of the rooster varies from 2.8 to 3.3 kg, the hen weighs from 2.2 to 2.7 kg. The OR can have a yellow-brown, white or black plumage colour. Knock-out defects of breeding traits in OR include a short body with a square body frame; comb with creases and dents; overgrowth; coarse pearling; different eye colour; partially white coloration of the auricle or high-borne tail. Discarding defects in plumage colour and colour surges in yellow-brown OR include an unevenly pale or dark spotted colour of the mantle; black stem drawing on the neck hinge; lack of black colour on the tail; brown tail; smoky or white undercoat; in a hen OR, the absence of a skeletal drawing; in white OR, it is a strong yellow tinge; differently coloured pens; for black OR the defect is the shine of purple or bronze colour; different colour of feathers; strong snags in squadrons; there are strong snags; dark tinge of the runners.<sup>7</sup>

Plymouth Rock (PL) is an elegant breed of large and strong stature, it was bred in the USA from the American Dominican breed. The rooster reaches a weight of 3-3.5 kg, the hen weighs 2.5-3 kg. The colours of the plumage and the colour features of PL are striped, black, white, yellow, partridge corrugated, white Colombian black, silver-coloured corrugated. The knock-out defects of the breeding traits in the case of PL shall be a thick or long head; different colour of the beak; heavily feathered face; narrow breasts; asymmetrical torso shape; falling or narrow back; steep tail; gaps between the rudder pens or mowers; narrow or too high posture.<sup>8</sup>

Knock-out defects of colour plumage and colour surges in PL striped: the base colour is mixed with brown, grey or yellow; the drawing is blurry; the undercoat is ash-gray to white or without drawing; for PL white: yellow tinge or feathers of a different colour; in PL yellow: the tail feathers are completely red in roosters, the hens have too dull colour; the undercoat is strongly smoked; the feathers are gray (applies to both sexes); PL partridge corrugated: in the rooster – the breasts, abdomen and shins are too or insufficiently redrawn; the drawing is missing in the neck seat hinge; the appearance of white lips; in a hen – the drawing on the breast and back is blurred to the point of missing; the overall picture has strong colour irregularities; the appearance of white lips; PL white Colombian black: the neck

hinge is sooty and has a strongly piercing stem drawing; a touch of yellow colour; there are black feathers on the back; there is a lot of white colour in the tail feathers; PL silver-coloured corrugated: in the rooster – the tinge of the covering lips is strongly yellow or brown; in the curtains there is a continuous or piercing stem drawing; the breasts are pure black or there is a lot of white drawing on the breasts, abdomen and shins; in the hen – a hint of a strong brown colour; larger brown areas are found in the covering plumage; the drawing is blurry or missing<sup>9</sup>

The Sussex (SU) is a medium-sized and medium-sized breed that has a calm and gullible disposition, comes from the English Sussex and Kent. It was formed by crossing English hens with heavy Asian breeds. The weight of the rooster varies from 3 to 4 kg, in the hen the weight is from 2.5 to 3 kg. SU can be colour-white Colombian black, yellow Colombian black, red Colombian black, brown wild coloured, brown porcelain, or gray-silver.<sup>10</sup> Knock-out defects of breeding features include the triangular shape of the torso; light and narrow body; falling or rounded back; strong formation of cushions; pointed and flat breasts; steep tail; low or high posture; thick bones; yellow beak or yellow treads. The discarding features of feather colour and colour surges in SU include white Colombian black: the curtain is in the colour of soot, and the stem drawing is strongly piercing in it; a touch of yellow; there is a lot of white in the tail feathers or squadrons of the I. order; instead of a black drawing, gray occurs; SU yellow Colombian black: the top colour is strongly reddish; black colouring in non-standard places; the appearance of gray spotty or white interlayers in the feathers; SU red Colombian black: the neck hinge is light and brass-coloured; there is too little black colour in the designated places; there is a white colour in the undercoat or on the upper lip; the overall colour is yellow, loamy, spotty or too dark; the appearance of black colour in non-standard places; SU brown wild coloured: the feathers are white in colour, the wings are very spotty, the curtain is strongly indented; SU brown porcelain: the pearl drawing in young animals is too large; on the breast of roosters lacks brown colour; in young animals, there is a larger snag on the tail; the hens have black breasts; the curtains are brass-coloured; the base colour is light brown, pale or has many black dots; there are many white lips in the plumage of the mantle; the feathers of the tail and wings are predominantly white.<sup>11</sup>

The Wyandotte (W) is a medium-weight and medium-tall breed that originated in the USA and was formed by crossing Rosecomb bantam, Hamburgh, Brahma and Chocin-China chickens. It is named after the extinct Native American tribe of the Wyandots. The weight of the rooster is from 3.4 to 3.8 kg, the weight of the hen is from 2.5 to 3 kg. The plumage colours and W-colours are white, black, blue, red, yellow, black-white-spotted, brown-porcelain, striped, golden-necked, silver-haired, partridge corrugated, silver-coloured corrugated, white Colombian black, yellow Colombian black, silver black-lined, gold black-lined, gold blue trimmed, gold white-lined. Discarding defects of breeding traits in W include a short or angular shape; narrow or low position of the tail; too long tail carried obliquely, possibly conical or fan-shaped above the level of the head; pronounced cushions; feathering on treads; More than a third of the clavicle in the auricle. Knockout defects of feather colour and colour surges are described for the sake of brevity only three colours – W white: there is a yellow colour in the curtains; W black: feathers do not have shine; the tail is coloured bronze; there is a strong croup in the cockerels and squadrons of roosters; treads of pale yellow colour in roosters and dark in hens; dark to black beak; W blue: the blue colour is whitish, sooty or spotted; the appearance of brown to rusty tones; there is a greenish sheen in the curtains, and in the tail of young

roosters; the beak is almost black; red: the colour is without shine; there is a snag in the undercoat; the neck hinge has a yellowish-red coloration.<sup>12</sup>

### Assessment of chickens

It is necessary to prepare the animal for the exhibition in advance. That is, it is necessary that at the time of the exhibition, the exterior features of the animal are as similar as possible to those required – the breeding standard and other conditions that must be observed during the exhibition, such as the health of the animal, the presence of parasites, etc. If the breeder wants to succeed at the exhibition, he should choose the most beautiful animal from the breeding. He should focus attention mainly on the shape of the breastbone of the animal. Indeed, in the case of a deformed shape of the pectoral bone, the animal will be excluded from the assessment. Breeders' exhibitions are realized in the Slovak Republic under the auspices of the Slovak Breeders' Association.<sup>13</sup>

It should also be noted that at present, breeders can also present at exhibitions perhaps all breeds of animals that are allowed to be bred in Slovakia. The fulfilment of the conditions imposed on breeding standards, in particular exterior features, is the most important factor in the assessment of the breed by the assessors at exhibitions (Figure 1-3).

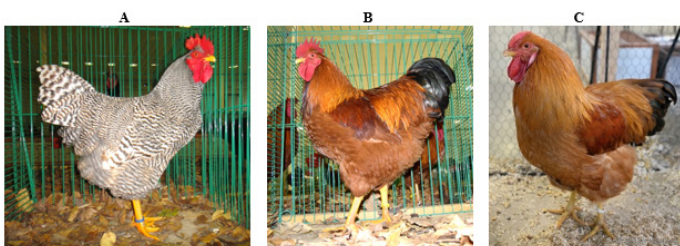


Figure 1 (A) Amrock, (B) New Hampshire Red, (C) Oravka.<sup>4</sup>

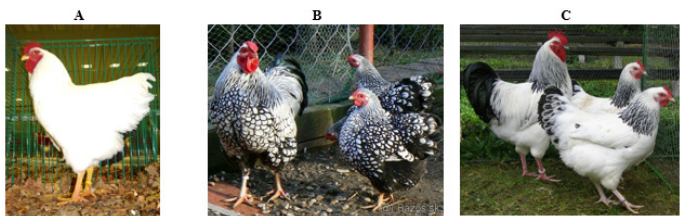


Figure 2 (A) Plymouth Rock, (B) Sussex, (C) Wyandotte.<sup>4</sup>

Exterior features were compared with the faults and strengths listed on the evaluation sheet of poultry that were assessed at 9 exhibitions. Observation, evaluation and subsequent awarding of prizes at exhibitions were performed by poultry judges who have passed the relevant professional examinations. Prior to the self-assessment, the judge checks the legibility and accuracy of the leg ring number. At the beginning of the judging, the chickens are weighed and their sex is checked. When evaluating, the examiners try to be as considerate as possible so as to disturb the chicken as little as possible. Judging of a chickens consists in comparing the exterior with the requirements of the standard for individual positions. The monitored physiological, morphological and specific morphological exterior characteristics of poultry form the appearance of the animal and are divided into five positions: 1. Breeding type and sexual expression (framework, constitution, fitness, skeleton); 2. Head (beak, comb, lobes, auricle, eyes, face); 3. Body shape (torso, neck, wings, legs, tail); 4. Feathers (colour, drawing, structure, feathered ornaments); 5. Readiness for the exhibition, care of the breeder.

Cage No		Exhibition Date		Points	Evaluation
Breed/Colour character		Sex	Weight		
Ring number		Vintage			
<b>Advantages</b>		<b>Recommendations</b>		<b>Defects</b>	
<b>Breed type and sexual expression /framework, constitution, fitness, skeleton/</b>					
<b>Head – /beak, comb, lobes, auricle, eyes, face/</b>					
<b>Body shape – /torso, neck, wings, legs, tail/</b>					
<b>Feathers – /colour, drawing, structure, feathered ornaments/</b>					
<b>Readiness for the exhibition, care of the breeder</b>					
EX: excellent – 97 or more pts; E: excellent – 96 pts; VG: very good – 95, 94, 93 pts; G: good – 92, 91 pts			S: satisfactory – 90, 89, 88, 87, 86 pts; D: discarded – 0 pts; NR: not rated – 0 pts		
Exhibition stamp		Stamp of the assessor		Prize awarded	

Figure 3 Poultry Valuation Card.

**Legend:** Abbreviations and corresponding intervals of rating points on valuation sheet: EX (excellent) – 97 or more pts; E, excellent; – 96 points; VG, very good; – 95, 94, 93 pts; G, good; – 92, 91 pts; S, satisfactory; – 90, 89, 88, 87, 86 pts; D, discarded; – 0 pts; NR, not rated; — 0 pts

Source: SZCH.<sup>14</sup>

### Statistical analysis

Pluses and minuses of judged breed exterior were summarized into Poultry valuation sheet. Statistical analysis was performed using software Microsoft Excel 2007. Chi square test ( $\chi^2$  test) was used to compare the individual position between the selected breeds of pigeon. The dependence of the individual signs was tested at a significance level of  $\alpha=0.05$ .

### Results and discussion

The assessment of individual breeds of poultry is the authoritative indicator for breeders in the next selection of breeding animals. The European system for the assessment of the poultry exterior at exhibitions emphasizes the advantages, recommendations and does not only points out the faults of the exhibited individuals. Each individual at the show is assigned an assessment card on which the following is listed: cage number, ring number (it also shows the year of hatching), sex (given by the breeder), breed, colour character, advantages, recommendations (small faults), deficiencies (major faults), exclusion deficiencies or deficiencies in breeder's care, evaluation (verbal), points and any award obtained, stamp of the show, date and stamp of the judge.<sup>15</sup>

Based on the evaluated data from nine exhibitions (Table 1), the most common exterior defects were found in the first position – Breed type and sexual expression in which framework, constitution, condition, skeleton and weight is assessed. The judges of chicken

breed emphasized that the correct proportionality of individual body parts with good vitality of the exhibited individuals should be the essential criteria. In addition to the incorrect ratio of the individual

body parts, a frequent exterior deficiency in all selected breeds was a lower or higher weight, smaller frame and weakly muscled body (Table 2).

**Table 1** Number of selected breeds assessed at individual exhibitions

Exhibition/year	utility breeds of chickens (pcs)					
	AM	NH	OR	PL	SU	W
Veľké Kostoľany	6	4	2	4		2
Košice	3	29	27	12	3	3
Veľké Kostoľany	10	4	6	4	2	4
Námestovo	2	6	3	16		1
Žilina	11	26	24	23	4	
Nitra	58	73	98	57	24	36
Námestovo		7	9	16		2
Námestovo		10	11	16	4	2
Žilina	8	12	17	7	8	3
breed together (pcs)	98	171	197	155	45	53
roosters; hens	50; 48	94; 77	93; 104	75; 80	15; 30	29; 24
Together (pcs)	719					

**Legend:** AM, amrock; NH, new hampshire red; OR, oravka; PL, plymouth rock; SU, sussex; W, wyandotte

**Table 2** Evaluation of the percentage of specific defects, merits, references and knock-out defects in the constitution, framework, fitness and skeleton

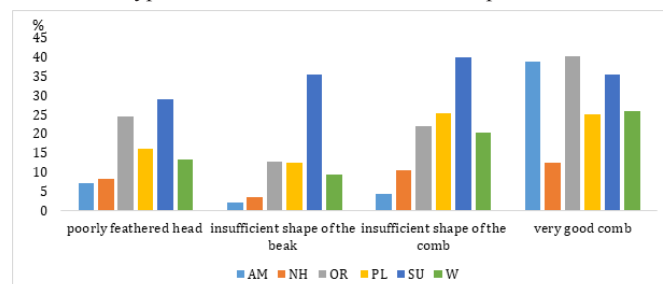
Breeds of chickens overall (pcs)	AM	NH	OR	PL	SU	W	P
defects (%)	98	171	197	155	45	53	
Lower weight	23.5	29.8	26.9	25.2	28.9	26.4	P<0.05
Higher weight	18.4	12.9	19.8	18.1	24.4	32.1	P<0.05
Smaller frame	39.8	27.5	26.9	36.8	46.7	35.8	P<0.05
Long body	43.9	12.9	17.3	20.0	33.3	22.6	P<0.05
Weakly muscled body	42.9	32.75	6.1	31.0	17.8	15.1	P<0.05
Low stance	12.2	9.4	10.7	34.2	22.3	20.8	NS
Advantages (%)							
Overall good	48.0	40.4	41.6	45.2	31.1	35.9	P<0.05
Recommendations (%)							
More musculature sternum	36.7	20.5	14.8	14.8	20.0	15.1	P<0.05
Bigger frame	28.6	15.8	12.2	11.6	26.7	9.4	NS
Lower stance	19.4	18.7	2.5	/	8.9	13.2	NS
Higher stance	15.3	10.5	8.1	18.0	/	17.0	NS

**Legend:** AM, amrock; NH, new hampshire red; OR, oravka; PL, plymouth rock; SU, sussex; W, Wyandotte; Percentual and statistical significance (P<0.05) are calculated from a selected breeds of poultry: 98 pcs of AM, 171 pcs of NH, 197 pcs of OR, 155 pcs of PL, 45 pcs of SU, 53 pcs of W; NS, non significant

The results in table 2 showed that up to 29.8 % of the OR had a lower weight and 32.1 % W had a higher weight. It is also interesting that at exhibitions as many as 46.7 % of SU had a smaller framework. The long torso compared to the ideal rates amounted to 43.9 % AM. In the case of the evaluation of defects of the weakly muscular torso (31.0 %) and low posture (34.2 %) were the most evaluated individuals of the PL breed.

According to the poultry breeding strategy,<sup>16</sup> lower weight and smaller framework are often related to poor condition during the rearing of young individuals and their preparation for the breeding season or exhibitions. In breeding facilities, individuals are often exposed to various stress factors. The main stress factories include insufficient nutrition with poor transition and nutritional composition of feed mixtures for individual stages of growth. Among other stressful factors include parasitic and other diseases, changes in temperatures or frequent traveling to the shows. It is therefore important that breeders maintain welfare and zoohygienic conditions with nutritional request in their breeding facilities for optimal growth and development of their individuals.

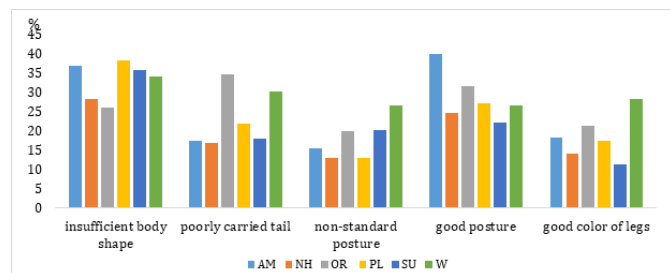
In the second position - Head in which beak, comb, lobes, auricle, eyes, face is assessed. The most common faults were a poorly feathered head with an insufficient shape of the beak and comb (Figure 4). Defects on the head were visible especially in roosters, which are a typical manifestation of sexual dimorphism.



**Figure 4** Evaluation of exterior faults and advantages in the second position – Head.

**Legend:** AM, amrock; NH, new hampshire red; OR, oravka; PL, plymouth rock; SU, sussex; W, wyandotte.

Low weight in some individuals had an impact on insufficient body shape which is judged in the third position. In addition, individuals from each evaluated breed with a poorly carried tail and non-standard posture were recorded in this position (Figure 5).



**Figure 5** Evaluation of exterior faults and advantages in the third position – Body shape.

**Legend:** AM, amrock; NH, new hampshire red; OR, oravka; PL, plymouth rock; SU, sussex; W, wyandotte.

One of the main reasons why breeders raise poultry is their color variability. Many factors determine the exact color point of a chicken, but there are only two color pigments that exist in chicken genetics – black and red. All colors and variants are made up of a combination of these pigments, whether they are diluted, enhanced, or otherwise

masked. Typically, desired colors are chosen by breeders, who may introduce other colors and markings to create the exact look of chicken that they desire.<sup>4</sup> Table 3 shows the evaluation of the percentage of specific defects, merits, references in the colour, drawing, structure and feathered ornaments which belong to the fourth position. For feather defects, up to 26.4 % of the whites in the squadrons and 13.2 % of the sparse plumage appeared in W. Nice color and good basic color were included among the exterior advantages of all the evaluated breeds. Another important advantage was the nice drawing of feathers in the NH, PL and OR breeds. Statistically significant recommendations for all judged breeds included better tail feathering and featherless legs. Similar to our observations, defects in sparse plumage and cover in squadrons were also observed in other utility and draft poultry breeds.<sup>17</sup> Comparing our results with evaluations from other countries, similar exterior deficiencies in feather structure, drawing and color were observed.<sup>18</sup>

Readiness for the exhibition and care of the breeder is evaluated in the last fifth position. Insufficient preparation for the exhibition and dirty feathers were the most common mistakes recorded in the NH (7.6 %) and AM (3.6 %). On the contrary, exterior advantages in this position included good preparation in the AM (26,5 %), OR (22.8 %) and W (22.6 %) with clean feathers in the PL (23.9 %), OR (21.3 %) and W (17.0 %).

**Table 3** Evaluation of the percentage of specific defects, merits, references and knock-out defects in the colour, drawing, structure and feathered ornaments

Breeds of chickens overall (pcs)	AM 98	NH 171	OR 197	PL 155	SU 45	W 53	P
defects (%)							
Cover in squadrons	/	/	11.7	/	/	26.4	NS
Sparse plumage	7.1	9.4	3.6	12.9	11.1	13.2	NS
Advantages (%)							
Nice colour	26.5	22.8	28.9	38.1	20.0	20.8	P<0.05
Nice drawing	/	39.2	35.0	36.8	26.7	28.30	NS
Good basic colour	34.7	10.5	23.9	20.7	15.6	17.0	P<0.05
Recommendations (%)							
Plumage structure	/	/	19.8	24.5	13.3	9.4	NS
Cleaner drawing	/	9.4	11.1	13.6	6.7	13.2	NS
Cover the neck	/	19.9	28.4	31.6	26.7	7.6	NS
Feather the tail	22.5	16.7	22.5	27.1	31.1	9.4	P<0.05
Bold base colour	6.1	/	/	/	11.1	17.0	NS
Feather the legs	9.2	6.4	7.1	21.9	15.6	17.0	P<0.05
Drawing in the wing cover	11.2	/	8.1	/	/	/	NS
A more typical drawing	/	10.5	14.1	/	33.3	13.2	NS
More balanced base colour	8.2	2.3	16.2	/	15.6	9.4	NS
Disabling defects (%)							
Loose plumage on thighs	/	2.9	/	/	/	/	NS
The presence of pillows	/	/	2.0	/	/	/	NS

**Legend:** AM, amrock; NH, new hampshire red; OR, oravka; PL, plymouth rock; SU, sussex; W, wyandotte; Percentual and statistical significance (P<0.05) are calculated from a selected breeds of poultry: 98 pcs of AM, 171 pcs of NH, 197 pcs of OR, 155 pcs of PL, 45 pcs of SU, 53 pcs of W; NS, non significant.

## Conclusion

Of the six selected breeds of chicken that were judged at 9 exhibitions, the most frequent exterior defects were observed in the first, third and fourth standard positions which have a major impact on their further breeding value or culling. When breeding exhibition poultry, it is necessary to have a certain amount of patience – especially in breeds that later mature (mature) externally. By hard selection and a certain ability to estimate the quality of the future external appearance of poultry, it is possible to build an exhibition-successful breeding. When selecting animals, one should also not forget about the performance characteristics of poultry, for example, laying,

increments, etc. A separate chapter, then, is the feeding and placement of poultry. The influences of heredity and nutrition also contribute to the creation of exterior signs. Today, it offers many special feed and complementary mixtures produced abroad, which can prepare an individual for evaluation in optimal exhibition condition.

## Acknowledgments

The study was support by grant KEGA no. 009UVLF-4/2021: Innovation and implementation of new knowledge of scientific research and breeding practice to improve the teaching of foreign students in the subject of Animal Husbandry.

## Conflicts of interests

Authors declare that there are no conflicts of interest.

## References

1. Patterson GW. Poultry farming. Encyclopedia Britannica. 2022.
2. Poultry exhibition, Poultry India Expo. 2022.
3. Smith AC, Chambers J. *The Plymouth Rock Chicken Standard and Breed Book*. Createspace Independent Publishing Platform, 2015. 446 p.
4. Zigo F. *Breeding and breeds of pigeons, poultry and exotic birds* (Slovak). Košice: UVLF in Kosice, 1<sup>st</sup> ed. 2017. 418 p.
5. Slovak Breeders Association of Small Animal, Sample book of poultry breeds – Amrock (in Slovak).
6. Slovak Breeders Association of Small Animal, Sample book of poultry breeds – New Hampshire. (In Slovak).
7. Ország J. Oravka Breeders' Club. Oravka standard and diminutive oravka. (In Slovak).
8. Slovak Breeders Association, Poultry preparation for exhibition. (In Slovak). 2005.
9. Slovak Breeders Association of Small Animal, Sample book of poultry breeds – Plymouth. (In Slovak).
10. Pavel I, Tuláček F. Sample book of poultry breeds. First edition. Praha: Czech Breeders (In Czech) 2006. 566 p.
11. Slovak Breeders Association of Small Animal, Sample book of poultry breeds – Sussex. (In Slovak).
12. Slovak Breeders Association of Small Animal, Sample book of poultry breeds – Wyandotte. (In Slovak).
13. Schille HJ. Poultry preparation for exhibition: Breeds and breeding. (In Slovak) Bratislava: Ikar. 2006. 288 p.
14. SZCH, Poultry assessment card. (In Slovak).
15. EE Documentation [online]. 2019.
16. Sahle Z, Berhan A. *National Poultry Breeding Strategy*. 2019.
17. *Chicken breeds*. Top Breeds of Show Quality Chickens for an Exhibition! 2022.
18. Johnson C. *Show Poultry Handbook*. 2022.