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Development of Computer Application Program Interface for the formulation of Broilers and Layers Diets from Alternative Feedstuffs

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Abstract
The main objective of this study was to develop computer Application Program Interface that will predict responses in different chicken types to alternative feedstuffs. Data used in the study were generated from published and unpublished feeding trials results. On the whole, 63 literature sources were identified and data generated from them were rearranged into usable formats, means of parameters such as inclusion levels, feed conversion ratio, average initial body weight, average final body weight, average daily weight gain across animal types on mixed and specific alternative feedstuffs were calculated and computer models were developed from them using javascript programming language. A computer web based Application Programme Interface (API) was also developed using the models, Hypertext Mark-up Language (HTML) and Cascading Style Sheet (CSS).Computer models should be encourage to circumvent the tedious feeding trials and wet lab approaches of determining responses in different animal species to specific alternative feedstuffs.

Keywords: Alternative feedstuffs, broilers, layers computer application program

Introduction

Large quantity of data has been generated over the years on the effects of alternative feedstuffs on different performance parameters such as feed intake, growth, hematology, serum chemistry, organ and carcass development as well as reproduction and quality characteristics. Aggregation of these could yield sets of input-response data suitable for further manipulation in order to identify useful correlations and trends. This could be a cheaper alternative to the tedious and costly feeding trials approach (Mojtaba, 2009; Hargreave, 2011). Such data could also be converted into querriable database and metadata of immense industrial benefits.

The main objective of the study is to develop computer Application Program Interface of the performance response of chickens to feeding with alternative feedstuff.

Materials and Methods

Data aggregation and rearrangement: On the whole, 63 literature sources were identified and data generated from them were rearranged to generate the Meta data. Means of parameters such as inclusion levels, Feed Conversion Ratio (FCR), Average initial body weight (g), Average final body weight (g) and Average daily weight gain (g) across animal types on mixed and specific alternative feedstuffs were calculated and imported into the appropriate columns of Javascript Multiple Regression Software (JMRS).

Model development: The model equations e.g. $Y_2 = 0.10833X_1 - 5.779X_2 + 2.4892$ and predicted values for parameters entered (Plate I) were generated by the click of a button. From Plate I, X_1 is inclusion level value, Y_1 is observed parameter, and Y_2 is model predicted value.

Results and Discussion

Computer Applications Program Interface (ASpI) Characteristics: The models developed from the data were used to develop computer interface (ASpI©) designed in the form of installable portal through which the relevant information could be entered and subsequently queried by farmers and researchers to obtain desired information. The ASpI© was developed with concepts similar to the Telagri© portal developed by Okoli (2015) with the main difference being that ASpI© is not linked to an online platform. It is offline and not yet adapted for use in mobile devices. Therefore ASpI© could be copied with a CD Rom or flash drive and installed in personal computers or laptops running on Microsoft windows 10 operating systems downwards.

ASpI© logic and interface source code: Samples of ASpI© logic source code and interface source code are shown in plates 2 and 3. This ASpI© contains an estimated 2000 lines of code (LoC) written to execute the ASpI© processes, which basically is to simulate performances of different animal species to specific alternative feedstuffs.

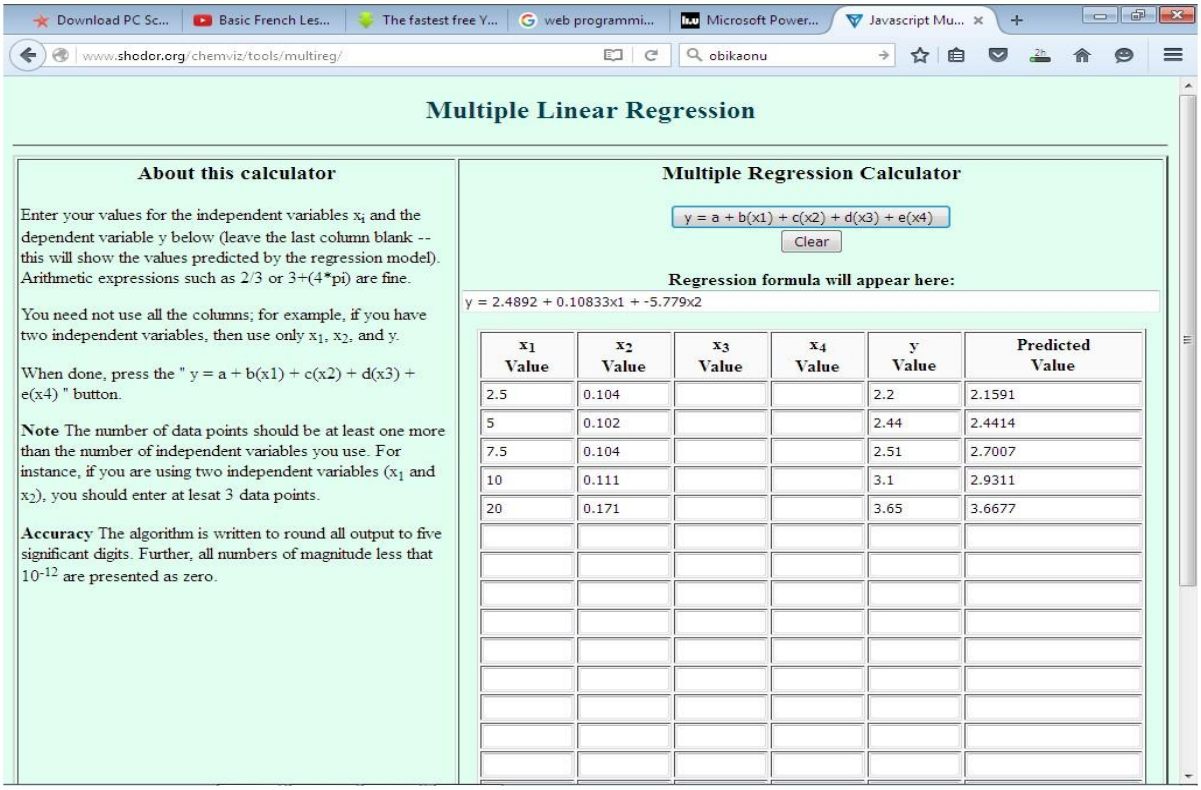

Plate 1: A snap shot of JMRS with data

Presently, the ASpI© portal is managed solely by the author and because it was written with JavaScript as the main programming language, the source code is open to whoever has access to the application. However, the author will not be responsible for any malfunction resulting from any attempt to manage the product by anyone else. All these however may change in the future as the product goes online.

Plate 4 shows the interface of different animal species categorization on the ASpI©. The interface has a menu section that contained clickable components ranging from DASHBOARD to ANIMAL TYPES on the left side. The right side contains three different graphs showing poultry performance trend on alternative feedstuffs.

```
{

feedstuff=document.getElementById('feedstuff').options[document.getElementById('feedstuff').selectedIndex].value;
    if(feedstuff!='choose')
    {
        if(feedstuff=='seed')
        {

        //α = 0.10833β - 5.779μ + 2.4892//fcr;
        //r = - 0.019942β + 0.52318μ + 0.86533//afbw;
        //θ = -0.0043374β - 0.50482μ + 0.33197//adwg;

            for(i=1;i<13;i++)
            {
            level=eval("document.formOne.level".concat(i));
            aibw=eval("document.formOne.aibw".concat(i));
            leveli=level.value;
            aibwi=aibw.value;
                if(leveli!="" && aibwi!="")
                {
                    fcr=((0.10833 * leveli) + ((-5.779 * aibwi)+ 2.4892)).toFixed(4);
                    afbw=((-0.019942 * leveli) + ((0.52318 * aibwi) + 0.86533)).toFixed(4);
                    adwg=((-0.0043374 * leveli) + ((-0.50482 * aibwi) + 0.33197)).toFixed(4);
                    eval("fcr"+i).value=fcr;
                    eval("afbw"+i).value=afbw;
                    eval("adwg"+i).value=adwg;
                    fi=eval((eval("fcr"+i).value * eval("adwg"+i).value)).toFixed(4);
                    eval("fi"+i).value=fi;

                }

            }

        }
        if(feedstuff=='agro')
        {
        //α = -0.04531β + 2.245θ + 1.5094 //fcr
        //θ = -0.010696β + 0.63669 α + 0.28562 //afbw
        //r = 0.00014796β + 0.021811θ + 0.0067865//adwg
```

Plate 2: Sample logic source code of the ASpI©

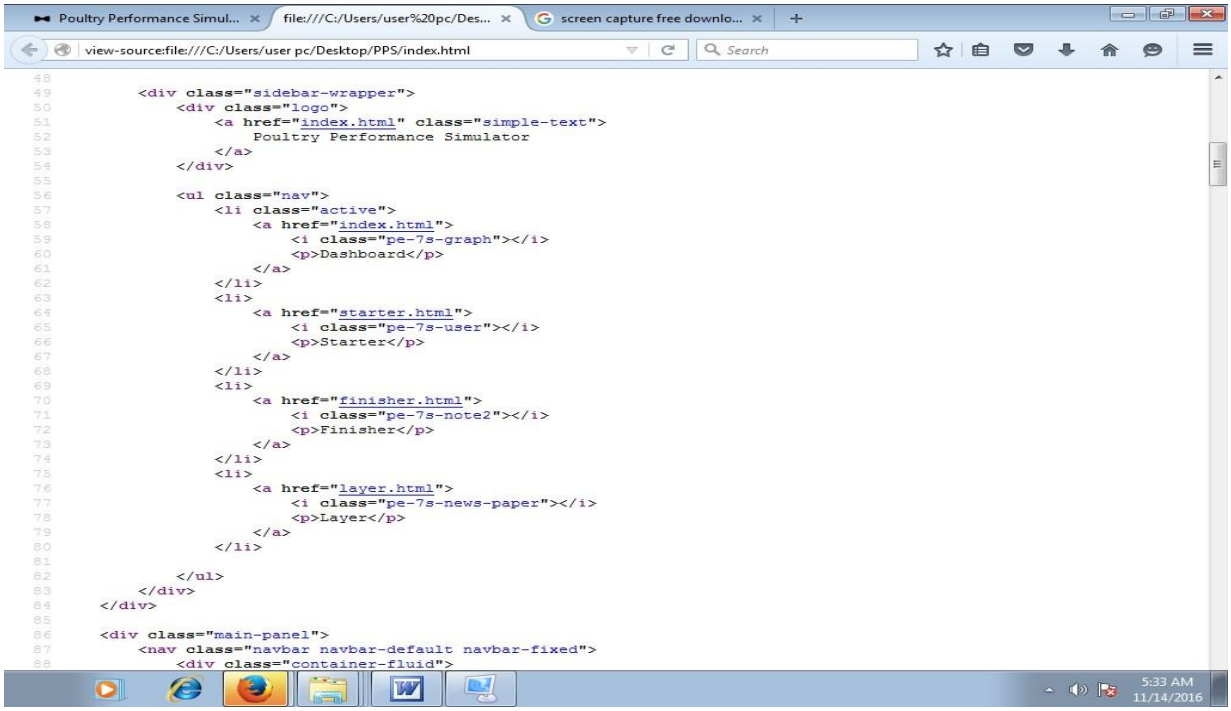

Plate 3: Sample interface source code of the ASpI©

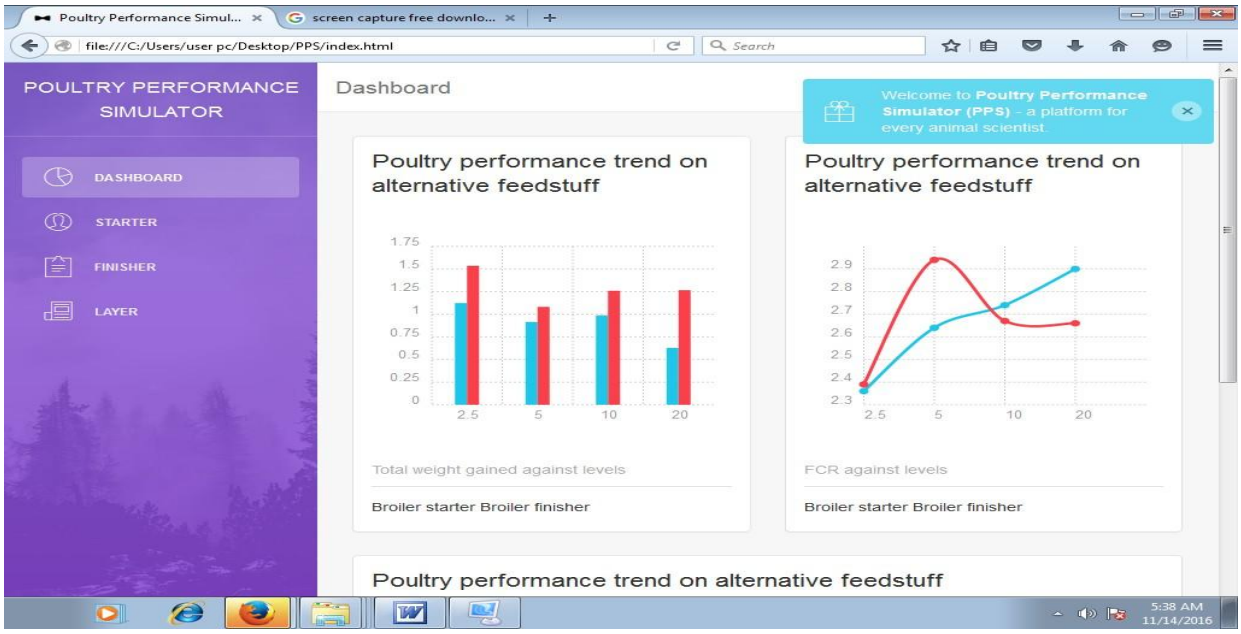

Plate 4: Categorization of animal types on the ASpI©

Conclusion

The ASPI© has been tested and is working and farmers can use it.

References

Hargreave, G. (2011). Adopting new technologies in broiler production. *Proceedings, the Poultry Federation*, Arkansas, Missouri, Oklahoma.

Mojtaba, Y. (2009). Alternative feed ingredients. *World Poultry Journal.*

Okoli, C.L. (2015). Mobile phone messaging system for agricultural information dissemination among farmers in Imo state, Nigeria. B. Agric Tech. Project Report, Federal University of Technology Owerri, Nigeria.